# Operation Manual

## OMEGAlap E 36

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# 1 Introduction

This chapter contains information about the work with the operation manual.

## 1.1 About the Operation Manual

The operation manual is a part of the machine and is to be kept at the machine. The instructions from the third-party suppliers are also to be kept at the machine.

The operation manual is identified by the material number and the revision number. These identification properties are specified in the legal notice.

## 1.2 Availability of the Operation Manual

The machine owner must make sure that the personnel read and obey the operation manual. The machine owner must make sure that the personnel that do the work always have easy and fast access to the operation manual.

## 1.3 Conventions Used

The writing conventions that are used are as follows:

| Writing Convention | | |
|---|---|---|
| **Name** | **Example** | **Description** |
| Section information | Chapter 1, 1.1, 1.1.1 | The chapter numbers are given in a sequence. The chapter numbering starts with the number 1. |
| Figure number | *Figure 1* | The figure numbers are given in a sequence. The figure numbering starts with the number 1. |
| Callout | 1 | The elements in the figure are identified with position numbers. |
| Prerequisite | ✓ | The given requirements are to be obeyed before the work or the operation starts. |
| Reference | ▶ | The reference to a different chapter or information is given. |

| Writing Convention | | |
|---|---|---|
| **Name** | **Example** | **Description** |
| Intermediate result | ⇨ | The intermediate result is the reaction of the machine or the assembly that occurs after a work step. The machine or the assembly is in a specified condition. |
| Instruction in a safety message | ▶ | The symbol starts the safety instruction in the safety message. |

## 1.4 Intended User

Only Rieter-approved personnel are permitted to operate the machine, do the maintenance work, and the repair work at the machine. The personnel must know the contents of this operation manual and how to find the related information.

The table contains information about the skills of the different personnel that do the work at the machine.

| Personnel | Description | Skills / Requirements |
|---|---|---|
| Mill manager, textile technologist | The mill manager or the textile technologist:<br>– Monitors the quality of the product<br>– Does the managment and monitors the production procedure<br>– Monitors the machine efficiency | The mill manager or the textile technologist completed the training as a textile engineer. |

| Personnel | Description | Skills / Requirements |
|---|---|---|
| Installation personnel | The installation personnel install the machine and the machine components.<br>The installation personnel:<br>– Are responsible to install all machine components correctly<br>– Give instructions to the auxiliary personnel<br>– Give instructions to the electrician<br>– Do all function tests that are necessary for the commissioning of the machine<br>– Do the commissioning and puts the machine into operation after the machine is installed | The installation personnel:<br>– Are Rieter-approved persons and employees of Rieter<br>– Did the training courses supplied by Rieter<br>– Know all safety regulations that are necessary to install the machine and the machine components |
| Shift supervisor | The shift supervisor:<br>– Does the commissioning and the changeover of the machine<br>– Adjusts parameters<br>– Monitors the machine efficiency<br>– Does the troubleshooting | The shift supervisor:<br>– Did the training courses supplied by Rieter<br>– Knows all safety regulations that are necessary to put the machine and the machine components into operation<br>– Is a person with a training as a technician |
| Laboratory personnel | The laboratory personnel:<br>– Monitor the quality of the product<br>– Adjust parameters | The laboratory personnel:<br>– Did the training courses supplied by Rieter<br>– Are persons with a training as a textile engineer or laboratory technician |

| Personnel | Description | Skills / Requirements |
|---|---|---|
| Operator | The operator:<br>– Supplies the material to the machine<br>– Removes the material from the machine<br>– Prevents the standstill of the machine because of not sufficient material, cans, or tubes<br>– Does the daily cleaning work | The operator:<br>– Did the training courses supplied by Rieter or the shift supervisor<br>– Knows all safety regulations that are necessary to operate the machine and the machine components |
| Electrician | The electrician:<br>– Installs the current and the voltage supply at the machine<br>– Does the inspection work of the electrical components and the components of the safety circuit<br>– Does the electrical repair work<br>– Does the troubleshooting | The electrician:<br>– Is a person with a training as an electrician, an electronics engineer, or a mechatronics engineer<br>– Did the training courses supplied by Rieter<br>– Knows all safety regulations that are necessary to do the repair work and the maintenance work at the machine and the machine components |
| Mechanic | The mechanic:<br>– Does the mechanical inspection work of the machine and the components<br>– Does the mechanical repair work<br>– Does the troubleshooting | The mechanic:<br>– Is a person with a training as a mechanic<br>– Did the training courses supplied by Rieter<br>– Knows all safety regulations that are necessary to do the repair work and the maintenance work at the machine and the machine components |

| Personnel | Description | Skills / Requirements |
|---|---|---|
| Maintenance personnel | The maintenance personnel:<br>– Clean the machine and the machine components<br>– Do the lubrication of the machine | The maintenance personnel:<br>– Did the training courses supplied by Rieter and the shift supervisor<br>– Knows all safety regulations that are necessary to do the maintenance work at the machine and the machine components |

## 1.5 Liability

If the assembly of new or existing facilities is done by a third party that is against regulations, Maschinenfabrik Rieter AG (called Rieter) does not accept liability.

The auxiliary agents supplied by Rieter such as cranes, caster jacks, etc. are to be used only in the area and for the intended types of machine and for no other purpose. Rieter does not accept responsibility for damage because of inappropriate usage of the auxiliary agents.

If the machine is used for a purpose other than the intended purpose, Rieter does not accept liability.

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# 2 Safety

This chapter contains information about:

- The general safety information
- The intended users
- The location of the safety labels
- The safety equipment
- The danger zones

## 2.1 General Safety Information

This chapter contains information about the safety of the machine.

All personnel that do work at the machine must know and obey the safety instructions.

This machine has state-of-the-art technology and gives a high degree of operational safety.

The standards and directives applied during design, production, and configuration are recorded in the EC/EU Declaration of Conformity and the manufacturer's declaration.

Also, the national safety regulations, the mill safety regulations, and the applicable accident prevention regulations are to be obeyed.

### Failure to Obey Safety Instructions

Rieter is not liable for damage that is caused if the safety instructions are not obeyed, specially damage that is caused because of:

- The machine is used for different purposes than the machine is made for.
- Incorrect operation
- Incorrect selection of materials and tools
- Not sufficient or missing maintenance work and repair work

## 2.2 Safety Messages

The safety messages have 4 different signal words that refer to the severity level.

⚠

**DANGER**

**If these safety instructions are NOT obeyed, the situation causes death or severe injuries.**

**WARNING**

**If these safety instructions are NOT obeyed, the situation can cause death or severe injuries.**

**CAUTION**

**If these safety instructions are NOT obeyed, the situation can cause minor injuries.**

**NOTICE**

**This message shows that the user must obey the given instructions to prevent property damage.**

### Structure of the Safety Messages

Each safety message contains these elements:

- Safety alert symbol
- Signal word
- Type and source of the hazard
- Consequences if the dangerous situation is not prevented
- Instructions on how to prevent the dangerous situation
- 1 more warning symbol, mandatory symbol, or prohibition symbol can make clear the safety text

## 2.3 General Safety Instructions

The general safety instructions that follow are to be obeyed:

1. Give the machine key and the password only to approved personnel.
2. Only approved personnel are permitted to operate the machine.
3. Operate the machine only in a damage-free condition.
4. Stop the machine to change, install, remove, do maintenance work on, or to repair the machine or machine components.
5. Set the main switch to the position OFF. Padlock the main switch.
6. Keep the machine floor, the platforms, and the operating platforms clean of grease, oil, and other fluids.
7. Do not go onto the machine.
8. Always put on personal protective equipment.
9. Put away long hair.
10. Do not put on:

- Finger rings
- Wristwatches
- Scarves
- Loose clothes

### Safety Devices and Monitoring Devices

Only approved personnel are permitted to remove the safety devices and the monitoring devices. Before the devices are replaced, the approved personnel must make sure that the main switch is set to the position OFF, the main switch is padlocked, and the power supply is disconnected. Modifications that are not approved can cause death, injury, or property damage.

The instructions that follow are to be obeyed:

1. Do not make the safety devices short-circuit.
2. Replace defective safety devices of the safety circuit by original safety devices and with the full work unit only.
3. Only Rieter-approved personnel are permitted to assemble the machine.
4. Examine the correct function of the safety devices before the machine starts to operate, after commissioning, and when safety devices were replaced.
5. *Safety Circuit and Safe Torque Off (STO)* ▸ *24*

### External Transport System

The safety requirements for an external transport system are to be obeyed by the operating company.

The operating company must make sure that the warning signs, the mandatory signs, and the prohibition signs are possible to be read.

## 2.4 Emergency Report

A report of the accident must be as follows:

- Who makes the call?
- What occurred?
- What is the type of injury?
- When?
- Where?
- How many persons have an injury?
- Are there other dangers?

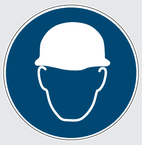
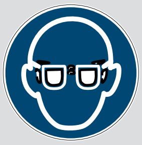
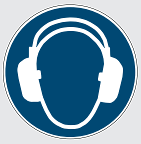
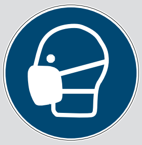
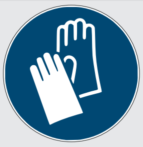
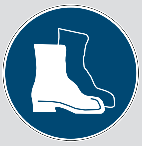
If an accident occurs:

1. Give first-aid treatment.

2. Make a call to the local emergency center.
3. Give information about the accident to Rieter.

## 2.5 Personal Protective Equipment

The personal protective equipment that follows is to be used:

| Symbol | Information |
|---|---|
|  | Safety helmet<br>Use a safety helmet to prevent head injuries. Refer to the EN 397:2012+A1:2012 standard. |
|  | Eye protection<br>Use eye protection to give protection to the eyes from particles that occur during work at the machine. Refer to the EN ISO 166 standard. |
|  | Ear protection<br>Use ear protection to give protection to ears from high-volume noise. Refer to the EN 352 standard. |
|  | Respiratory protection<br>Use respiratory protection to give protection to the respiratory tract from dust. Refer to the EN 149:2001+A1:2009 standard. |
|  | Safety gloves<br>Use cut-resistant safety gloves that have a flexible, impact-resistant layer to give protection to hands from cut injuries. Refer to the standard EN 388:2016.<br>Use chemical-resistant safety gloves to give protection to hands from injuries by chemical materials. Refer to the EN 374 standard.<br>Use heat-resistant safety gloves to give protection to hands from burns. Refer to the EN ISO 407 standard. |
|  | Safety shoes<br>Use safety shoes to give protection to feet from injuries and personnel from electric shocks. Refer to the EN ISO 20345 standard (category S3). |

## 2.6 Preventing Damage of Electronic Components

Electronic components are sensitive to electrostatic charges.

1. Release the electrostatic charge on grounded metal parts before contact with electronic components. Use a grounding wristband.

2. Touch electronic components only if necessary.

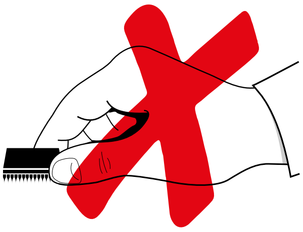


*Figure 1: Electronic components*

3. Do not touch the pins or parts of the printed circuit board of electronic components.

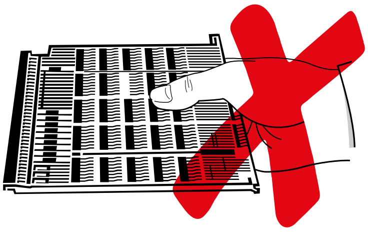


*Figure 2: Pins or tracks of electronic components*

4. Do not let electronic components touch objects that have an electrostatic charge (for example, synthetic materials).

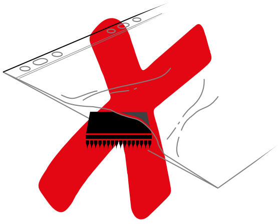


*Figure 3: Electronic components and electrostatically chargeable objects*

5. Do not keep electronic components near computer screens. Keep a distance of a minimum of 10 cm between an electronic component and the computer screen.

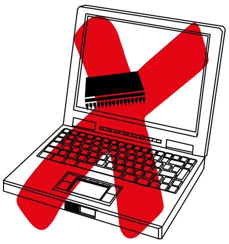


*Figure 4: Electronic components near computer screens*

## 2.7 Fire Protection

Fires can occur during the processing of textile materials.

Fires can occur because of:

- Smoking
- Contact of the fiber material with hot surfaces as, for example, hot bearings
- Fiber material gets in contact with sparks that occur during the grinding of metals or because of a short circuit, for example metal parts in the cotton bale.

The personnel must know how to operate the manually operated extinguishing systems to extinguish fires.

The instruction of the personnel about the extinguishing systems and about the escape procedures is necessary.

The standards of the local fire protection authorities are to be obeyed to operate the fire extinguishing systems.

To prevent the explosion of trash particles, dust, and fibers:

- An air circulation system is to be specially installed in the areas of fiber operation.
- The pipe system that moves the fibers is to be grounded.
- Dust and fibers are to be removed regularly.
- A vacuum cleaner is to be used.

## 2.8 Safety Circuit and Safe Torque Off (STO)

The safety circuit has sensors, operating elements, and actuators.

The safety circuit is used to give protection to the personnel, the environment, and the equipment.

The electrical documentation contains the information about the safety circuit connections.

The safety devices of the safety circuit are as follows:

- Emergency stop buttons
- Safety limit switches at the doors and the hoods
- Safety relays
- Frequency converters and control systems of stepper motors with integrated functional safety

### Safety Functions of the Frequency Converters and the Control Systems of the Stepper Motors

| Safety Function Abbreviation | Safety Function |
|---|---|
| STO | Safe Torque Off |

| Safety Function Abbreviation | Safety Function |
|---|---|
| SOS | Safe Operating Stop |
| SBC | Safe Brake Control |
| SS1 | Safe Stop 1 |
| SS2 | Safe Stop 2 |
| SSM | Safe Speed Monitor |
| SLS | Safe Limited Speed |
| SDI | Safe Direction |

## Safe Torque Off (STO) (EN 60204-1)

The STO function makes sure that the torque-generating energy has no effect on the motor. The STO function prevents the motor from an automatic start-up. The control unit of the motor monitors the operating state.

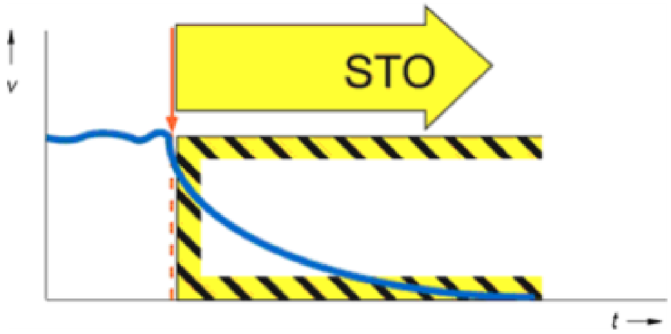


*Figure 5: Safe torque off*

## Safety Instructions for Maintenance Work

1. The safety devices in the safety circuit are not to be opened. The safety circuit is not to be changed.
2. The defective safety devices are to be replaced with the full work unit only.
3. Only let the manufacturer or an organization (Rieter Repair Station) that has written approval repair the safety devices.
4. The necessary measures are given in the "Maintenance" chapter in the operation manual.

## After Replacement of a Safety Component

1. Do a function test of the safety circuit. *Inspection Tasks* ▸ *329*
2. Record the results of the function test in the protocol for the safety circuit in the electrical documentation. Record in the protocol of the safety circuit in the electrical documentation if a safety device was replaced. *Protocol for the Safety Circuit* ▸ *293*

### Exclusion of Liability

The standards in the operation manual are to be obeyed. Opened or changed safety devices can cause injuries to personnel or damage to the machine.

If changes that are not approved are made to the safety devices, the warranty by Rieter is not applicable.

The customer has full responsibility for costs that are caused by changes that are not approved to the safety devices.

## 2.9 Product Safety

This chapter contains information about the product safety.

### 2.9.1 Safety Symbols at the Machine (SERVOtrolley)

The safety symbols are the machine-specified safety. The safety symbols are put at the locations where there are possible existing risks.

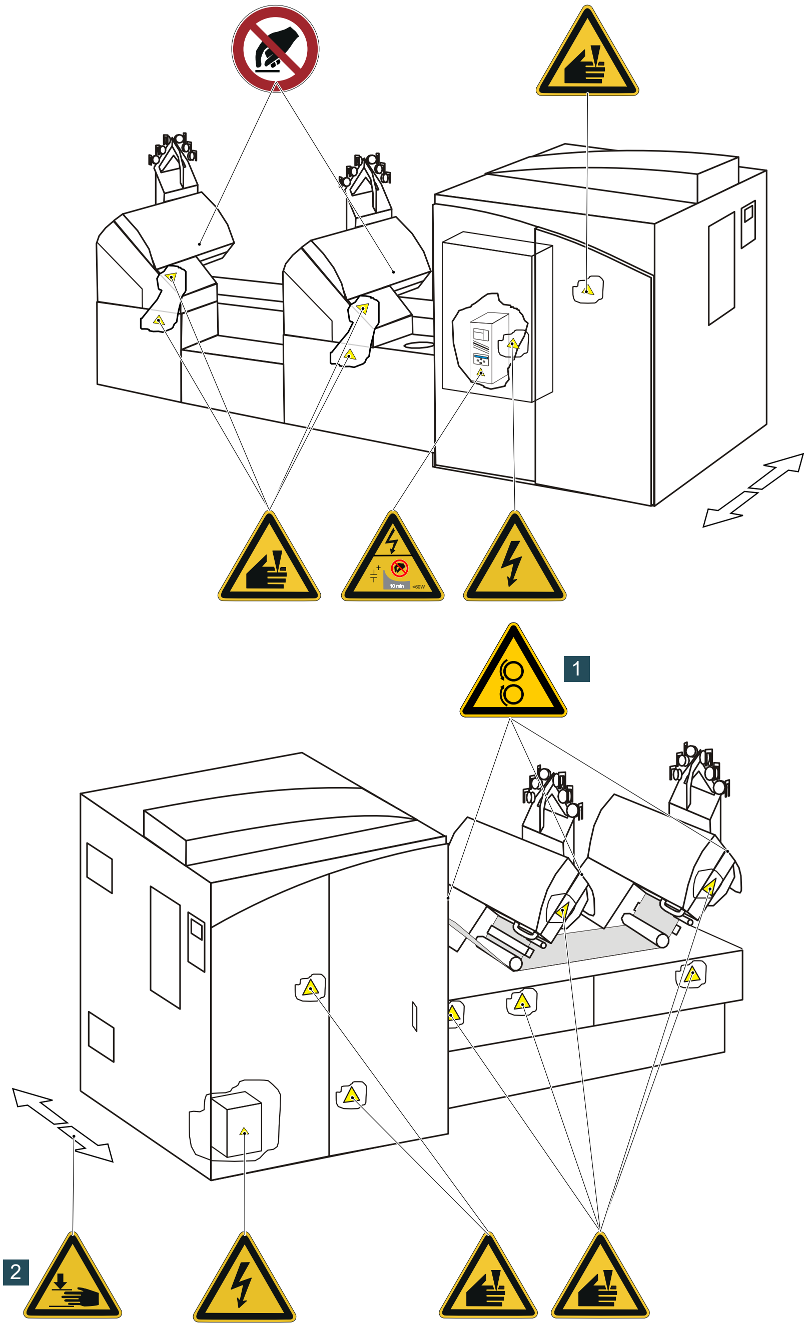
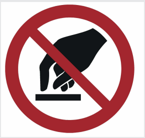


Figure 6: Safety symbols (SERVOtrolley)

| Safety Symbol | Description |
|---|---|
|  | Prohibition!<br>Do not touch!<br>A hand injury is possible to occur if the operator touches the moving calender cylinders. |

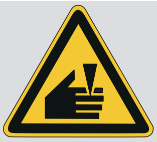
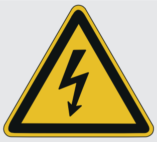
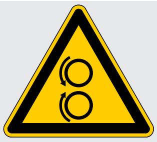
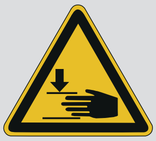
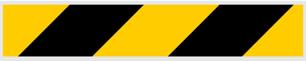
| Safety Symbol | Description |
|---|---|
|  | Caution!<br>Injury of hands!<br>An injury is possible to occur if the machine part that is near the safety symbol moves. |
|  | Warning!<br>Electric shock! |
|  | Warning!<br>An electric shock is possible to occur if the operator touches the component in 10 minutes after the main power supply is disconnected. |
|  | Warning!<br>Counter turning rollers!<br>An injury is possible to be caused by the counter turning rollers in the machine if the operator puts the hand into the openings. |
|  | Caution!<br>Squeeze of hands!<br>An injury is possible to occur if the operator removes the cover of the trolley cover rail. |
|  | Warning!<br>Dangerous zone! |

*Table 1:* Descriptions of the safety symbols

**Safety symbol 1**

1 safety symbol 1 is at the batt infeed section. The other 2 safety symbols 1 are at the related covers of the 2 drafting systems.

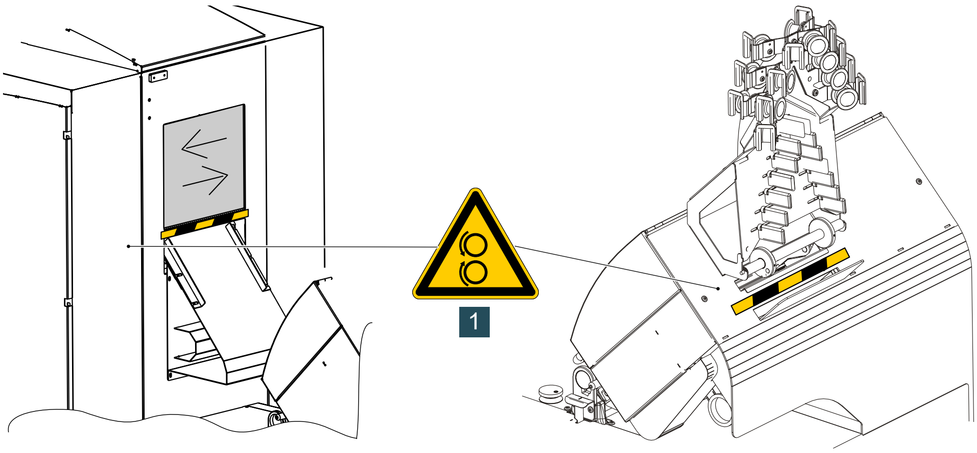


Figure 7: Safety symbol locations of counter turning rollers

### Safety symbol **2**

The safety symbol 2 is on the cover of the trolley rail 3.

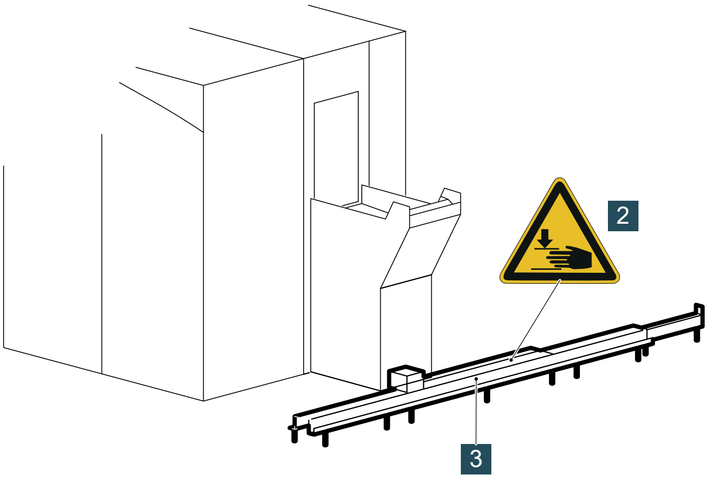


Figure 8: Trolley rail

## 2.9.2 Safety Symbols at the Machine (SERVOlap)

The safety symbols are the machine-specified safety. The safety symbols are put at the locations where there are possible existing risks.

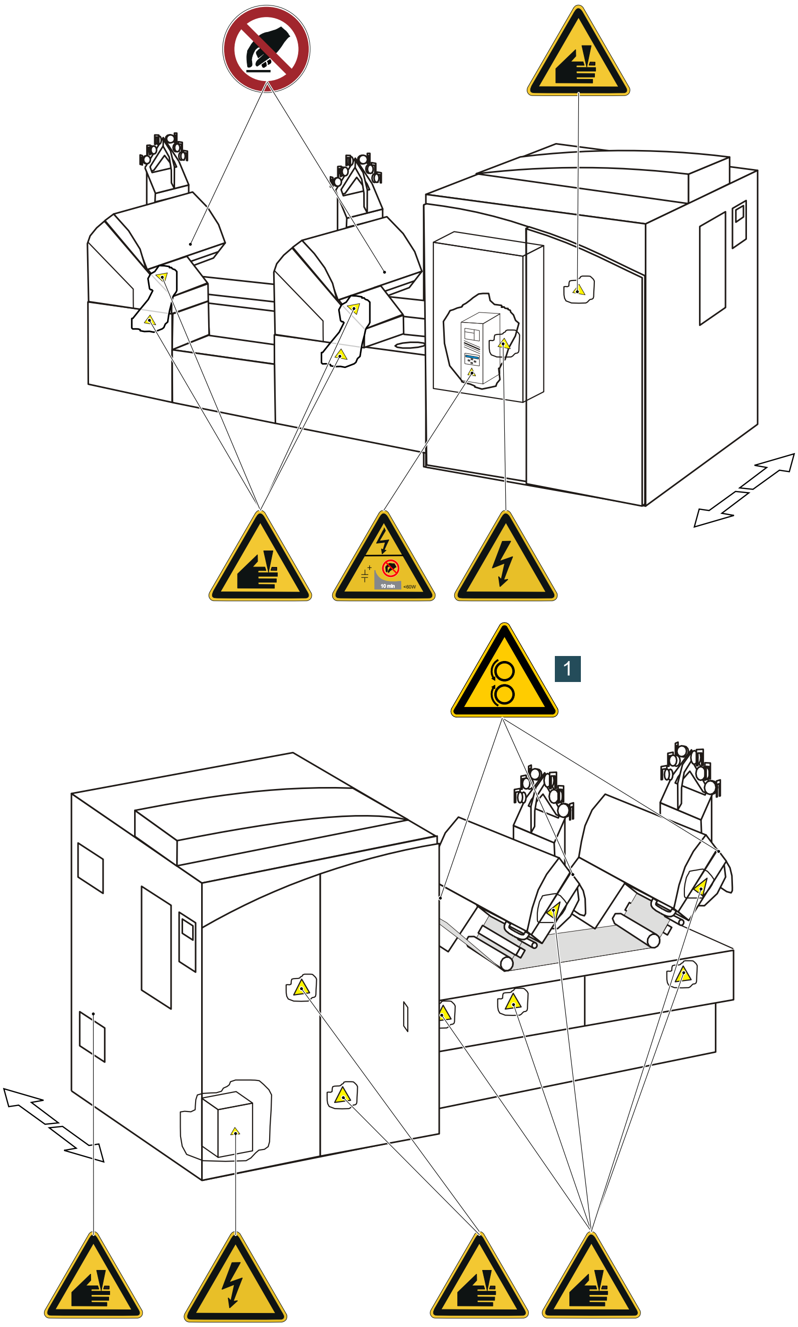
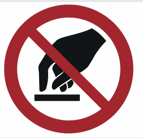


*Figure 9: Safety symbols (SERVOlap)*

| Safety Symbol | Description |
|---|---|
|  | Prohibition!<br>Do not touch!<br>The hand injury is possible to occur if the operator touches the moving calender cylinders. |

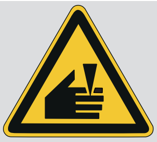
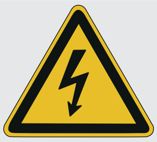
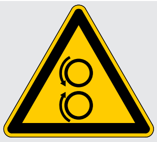
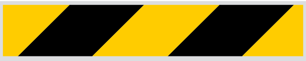
| Safety Symbol | Description |
|---|---|
|  | Caution!<br>Injury of hands!<br>An injury is possible to occur if the machine part that is near the safety symbol moves. |
|  | Warning!<br>Electric shock! |
| | Warning!<br>An electric shock is possible to occur if the operator touches the component in 10 minutes after the main power supply is disconnected. |
|  | Warning!<br>Counter turning rollers!<br>An injury is possible to be caused by the counter turning rollers in the machine if the operator put the hand into the openings. |
|  | Warning!<br>Dangerous zone! |

*Table 2:* Descriptions of the safety symbols

**Safety symbol 1** 1 safety symbol 1 is at the batt infeed section. The other 2 safety symbols 1 are at the related covers of the 2 drafting systems.

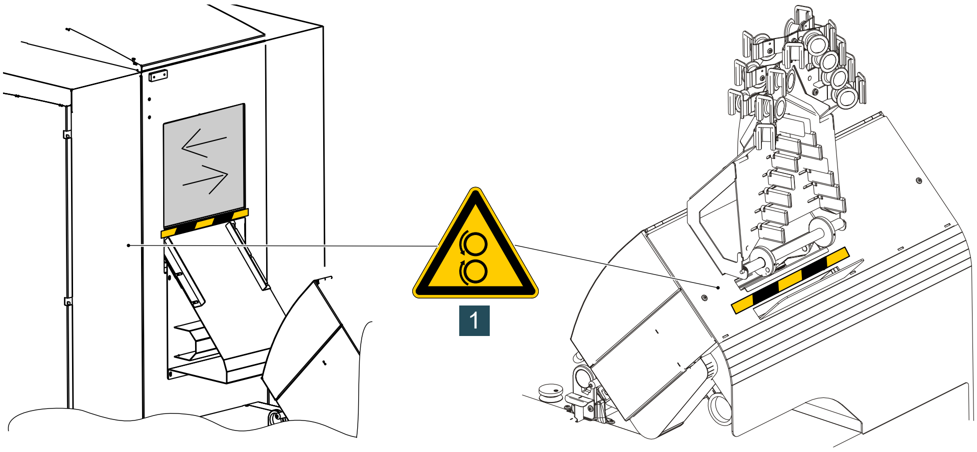


*Figure 10: The safety symbol positions of counter turning rollers*

## 2.9.3 Safety Devices at the Machine

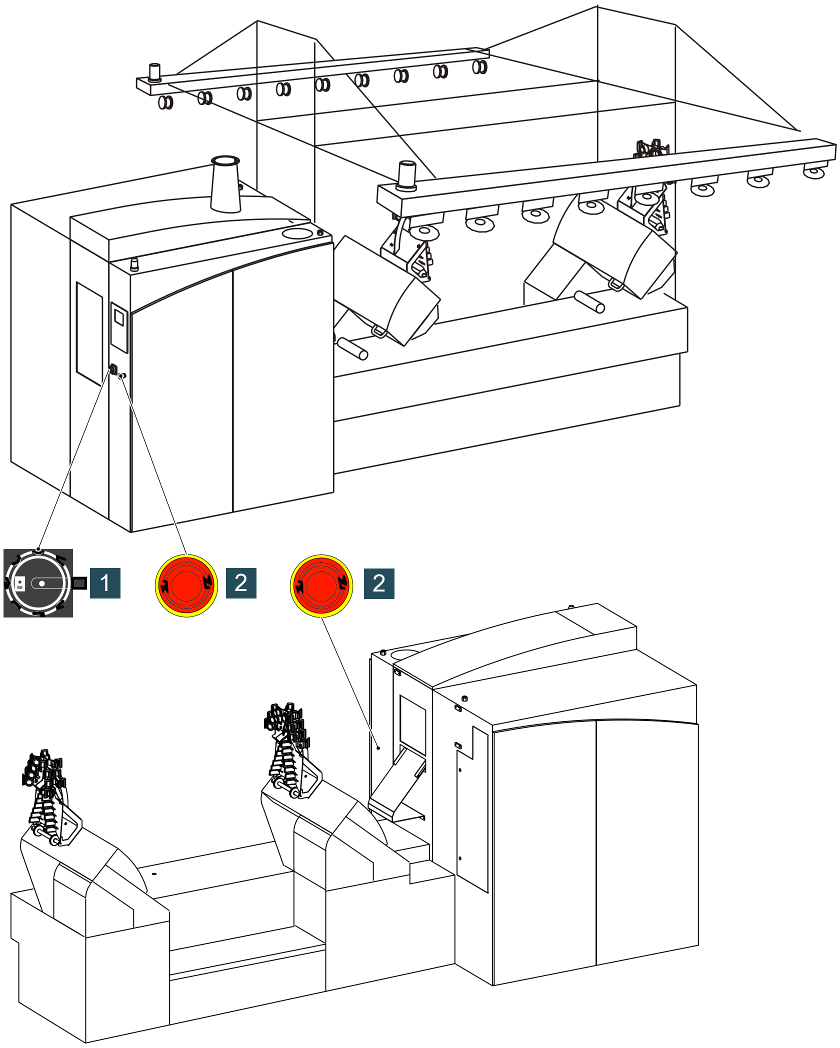


*Figure 11: Safety devices*

The machine has the safety devices as follows:

- Main switch 1
- Emergency stop button 2

### Main Switch

The main switch 1 has the position 0/OFF and the position I/ON. The main switch is set to the position 0/OFF to disconnect the power supply from the machine or set to the position I/ON to connect the power supply to the machine. The main switch is not an emergency stop button.

The main switch is necessary to be set to the position 0/OFF and to be padlocked before the maintenance work and the repair work.

### Emergency Stop Button

The emergency stop button 2 is only used if there is an emergency. When the operator pushes the emergency stop button, the results that follow occur:

- The machine stops immediately.▪
- All connected peripheral machines of the machine stop immediately.

The emergency stop button is possible to be released by turning the button.

## 2.9.4 Danger Zones (SERVOtrolley)

The mechanical and electrical danger zones at the machine are shown in the figure that follows.

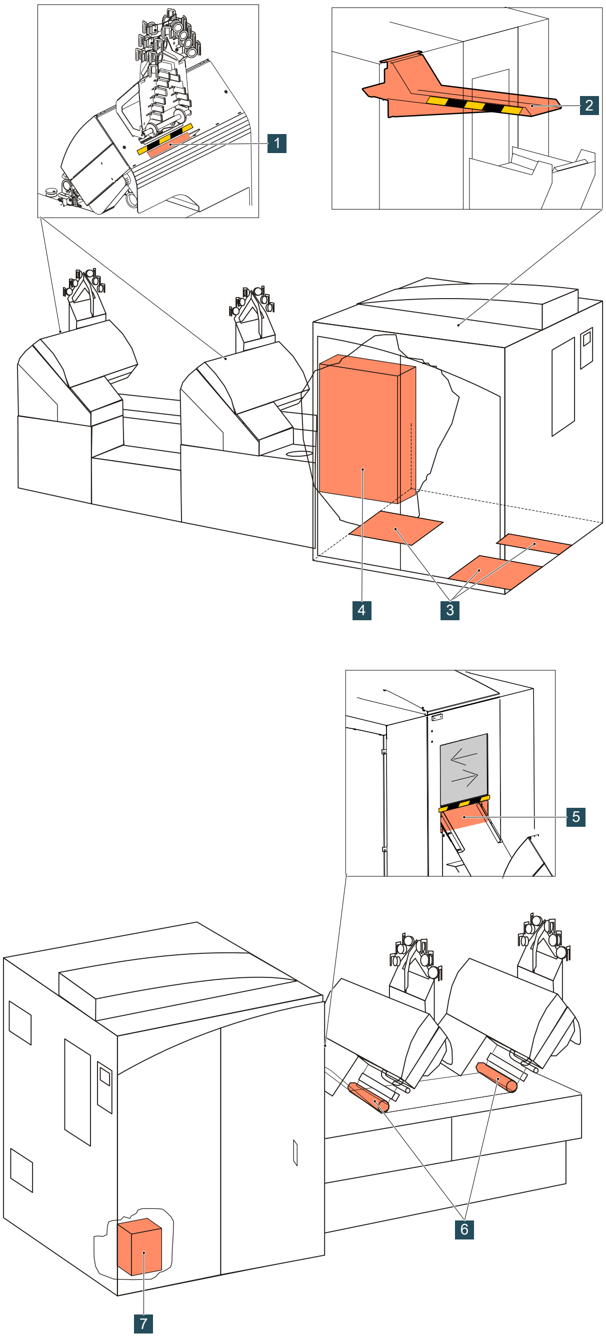


*Figure 12: Danger zones (SERVOtrolley)*

### Mechanical Danger Zones (SERVOtrolley)

The injury is possible to be caused by the counter turning rollers in the machine if the operator puts the hand into the openings 1 or 5.

The height of the tube guide 2 is less than 1.9 m. The user must prevent to crash on the tube guide 2.

The injury is possible to be caused by the turning calender cylinders 6.

**Danger zones 3** The internal danger zones 3 are the zones near the parts 8, 9, and 10 in the machine.

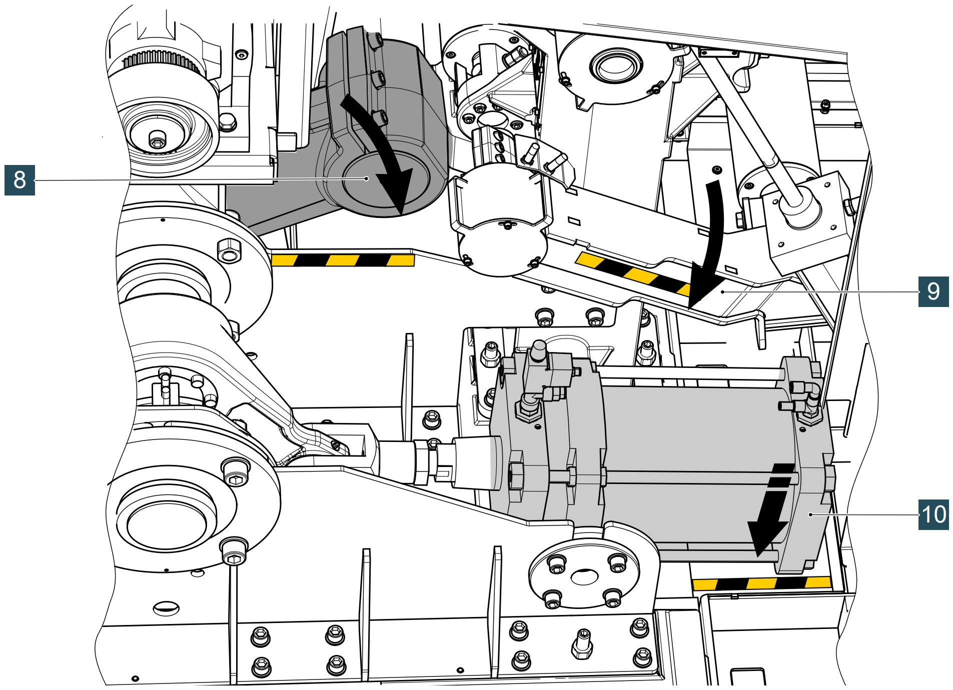


*Figure 13: The danger zones in the machine (SERVOtrolley)*

The tension lever 8 hits the base plate at some moments.

The tension cylinder 10 hits the base plate at some moments.

The passive lever 9 hits some parts at some moments.

In the service mode, an injury can occur if the user puts the hand in the danger zones 3 at the hitting moments.

### Electrical Danger Zones (SERVOtrolley)

After the machine is stopped, the electrical parts are possibly in operation. These electrical parts are identified by the safety symbols in the control cabinet 4 and the transformer 7. If the personnel touch the electrical parts, the electric shock causes death or injury. Only approved personnel are permitted to open the control cabinet 4 and the transformer 7.

## 2.9.5 Danger Zones (SERVOlap)

The mechanical and electrical danger zones at the machine are shown in the figure that follows.

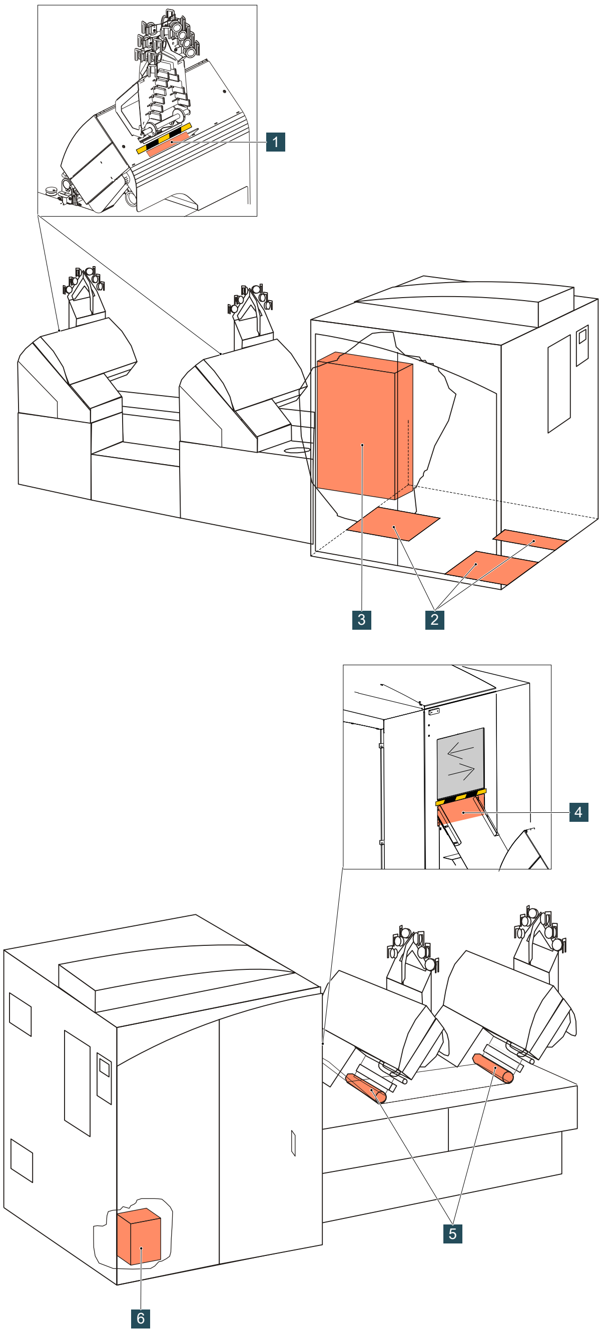


*Figure 14: Danger zones (SEVOlap)*

## Mechanical Danger Zones

An injury is possible to be caused by the counter turning rollers in the machine if the operator puts the hand in the openings 1.

An injury is possible to be caused by the turning calender cylinders 4.

**Danger zone 2** The internal danger zones 2 are the zones near the parts 7, 8, and 9 in the machine.

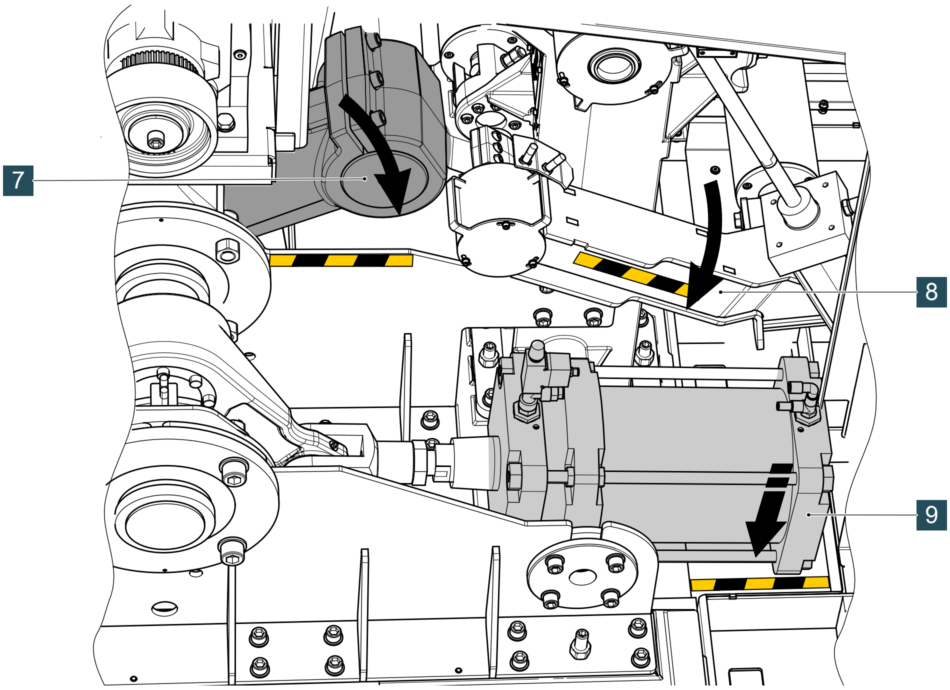


*Figure 15: The warning tape inside the machine (SERVOlap)*

The tension lever 7 hits the base plate at some moments.

The tension cylinder 9 hits the base plate at some moments.

The passive lever 8 hits some parts at some moments.

In the service mode, an injury can occur if the user puts the hand in the danger zones 3 at the hitting moments.

### Electrical Danger Zones

Even when the machine is stopped, electrical parts are possibly in operation. These electrical parts are identified by the safety symbols in the control cabinet 3 and the transformer 6. If the personnel touch electrical parts, the electric shock causes death or injury. Only approved personnel are permitted to open the control cabinet 3 and the transformer 6.

## 2.9.6 Caution of the Lap Delivery

When the machine is in operation, the fork head 2 is possible to be detached from the bolt 1 because of the open end of the fork head 2. If something is in the gap 4 between the rocker 5 and the rear wall 3, the fork head 2 is to be detached from the bolt 1.

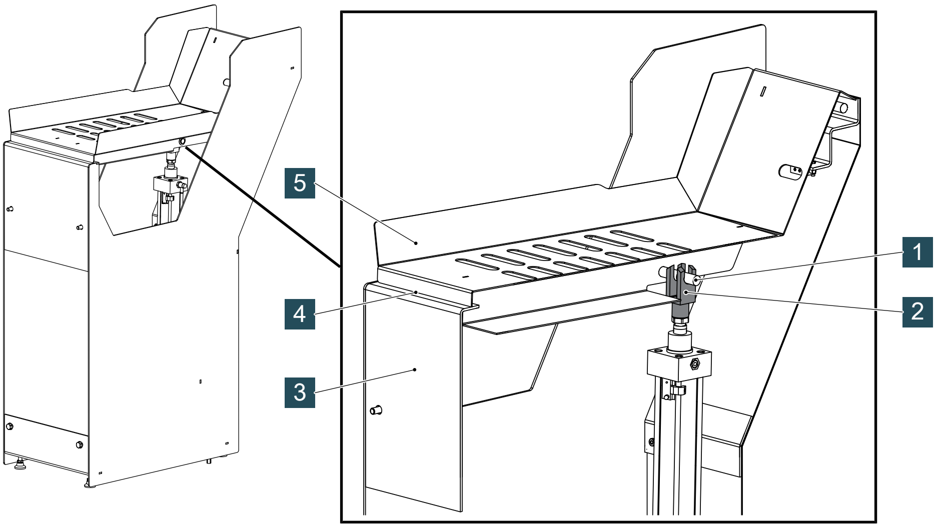


*Figure 16: Cross section of lap delivery*

## CAUTION

**The fork head is attached to the bolt.**

If the fork head cannot be separated from the bolt, when the cylinder retracts, injuries to the fingers can occur if the fingers become held into the gap.

- Do NOT put your fingers into the gap.
- Do NOT attach the fork head to the bolt with cable ties or other items.

# 3 Product Information

This chapter contains information about:

- The intended use of the machine
- The location of the identification plate
- The primary machine assemblies
- The basic machine functions
- The technical data
- The EC/EU Declaration of Conformity

## 3.1 Intended Use

The Rieter OMEGAlap E 36 makes the lap with the draw frame sliver.

The personnel that operate the machine must obey the instructions of this operation manual. All operations other than the operations given in this operation manual are **not** permitted.

## 3.2 Raw Materials

The machine only uses the textile raw materials that follow:

| | |
|---|---|
| Cotton | From all sources |
| Man-made fibers | Natural and synthetic polymers |
| Maximum fiber length | 65 mm |
| Maximum cut length | 60 mm |

## 3.3 Overview of the Machine

### The Primary Sections

The primary sections and the side names of the machine are shown in the figure that follows.

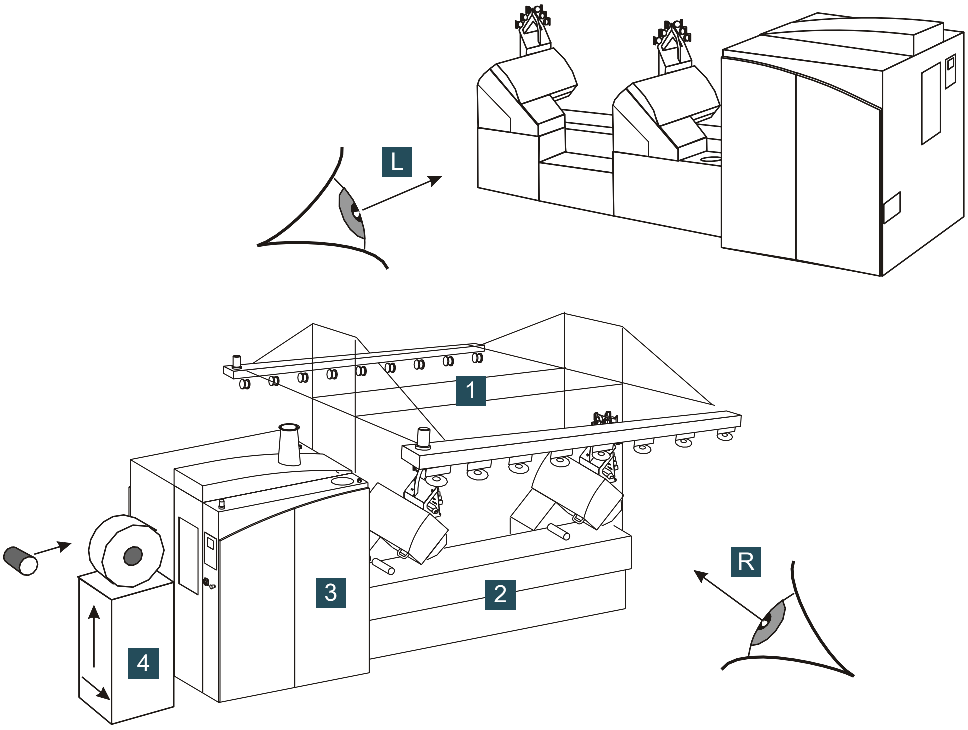


*Figure 17: Machine overview*

| | | | |
|---|---|---|---|
| 1 | Feed creel | 2 | Longitudinal section |
| 3 | Lap head | 4 | Lap delivery section |

**L** The left side of the machine

**R** The right side of the machine

## The Operating Procedure

The primary parts of the machine and the material flow are shown in the figure that follows.

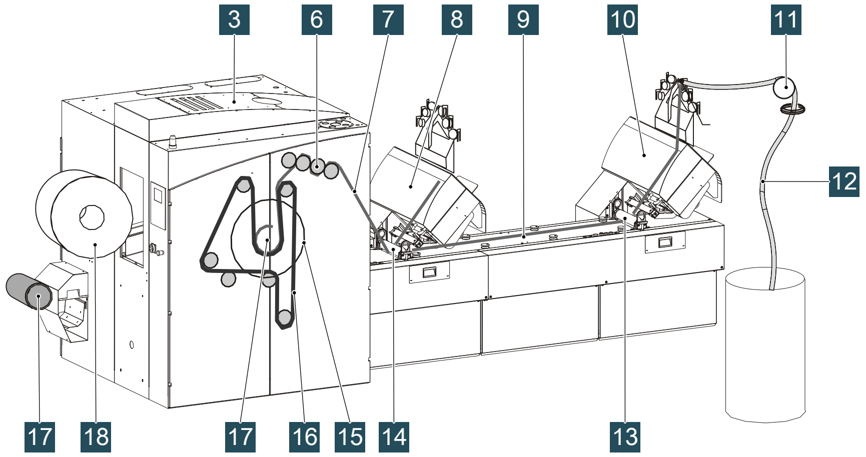


*Figure 18: Operating procedure*

| | | | |
|---|---|---|---|
| 3 | Lap head | 6 | Calender module |
| 7 | Batt | 8 | Front drafting system |
| 9 | Web | 10 | Rear drafting system |
| 11 | Sliver guide | 12 | Draw-frame sliver |
| 13 | Rear table calender | 14 | Front table calender |
| 15 | Lap disks | 16 | Lap belt |
| 17 | Tube | 18 | Lap |

The front drafting system 8 and the rear drafting system 10 pull the draw frame slivers 12 in and put the slivers 12 together, and then the web 9 is made. The table calender cylinders at the table calender 13 and the 14 compress the web 9, and then send the web 9 to the direction of the lap head 3. The web 9 from the front drafting system 8 stays on the top of the web 9 from the rear drafting system 10, then the batt 7 is made. The batt 7 goes through the calender module 6. Then the batt is compressed by the lap belt 16 and is wound on the tube 17, and then the lap 18 is made.

## 3.4 Function Description

The chapters that follow contain information about the function of the machine and the primary components.

### 3.4.1 Feed Creel

This section contains the information about the feed creel of the machine.

### 3.4.1.1 Sliver Guide and Sensor

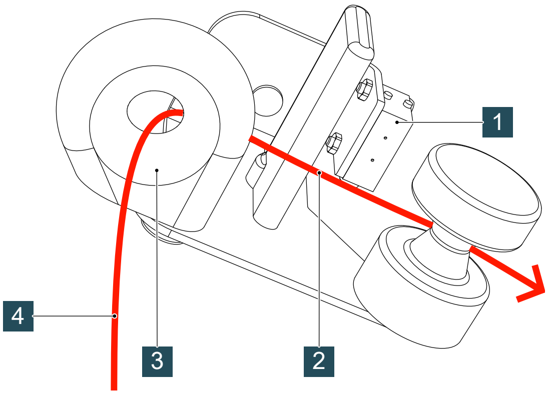


*Figure 19: Sliver guide and the sensor*

| | | | |
|---|---|---|---|
| 1 | Sensor | 2 | Draw-frame sliver |
| 3 | Sliver guide | 4 | Flow direction of the silver |

To prevent the incorrect draft or twist of the draw-frame sliver 2, the draw-frame sliver 2 goes through the sliver guide 3 when the sliver moves to the machine. The sensor 1 monitors the draw-frame sliver 2 when the sliver 2 moves.

#### Sensor

**Standstill** The sensor 1 monitors if there is a draw-frame sliver 2 below the sensor 1 when the machine is at a standstill.

**Operation** The sensor 1 monitors if there is a moving draw-frame sliver 2 below the sensor 1 when the machine is in operation.

### 3.4.2 Drafting System

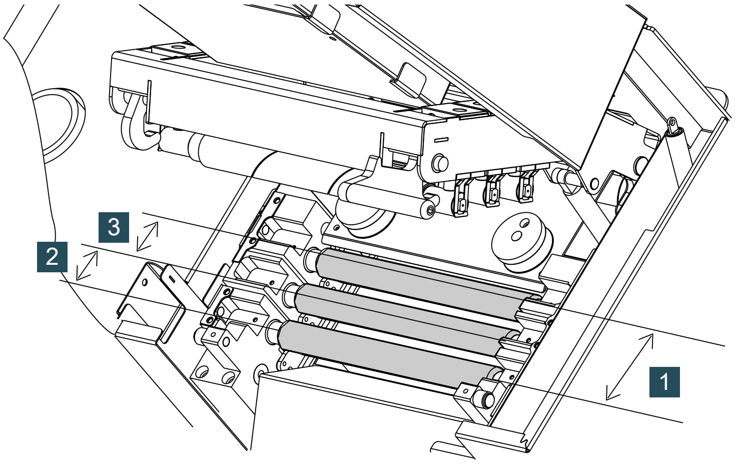


*Figure 20: Drafting system*

| | | | |
|---|---|---|---|
| 1 | Total draft (GV) zone | 2 | Main draft (HV) zone |
| 3 | Break draft (VV) zone | | |

The drafting system has the drafting zones that follow:

- Total draft (GV) zone: 1.395 - 2.427 draft
- Main draft (HV) zone: 1.314 - 2.285 draft
- Break draft (VV) zone: 1.032 - 1.112 draft

The drafting system has 3 top rollers and 3 bottom rollers. The load that is applied to the drafting system is supplied by the pneumatic pressure.

### 3.4.3 Calender Module

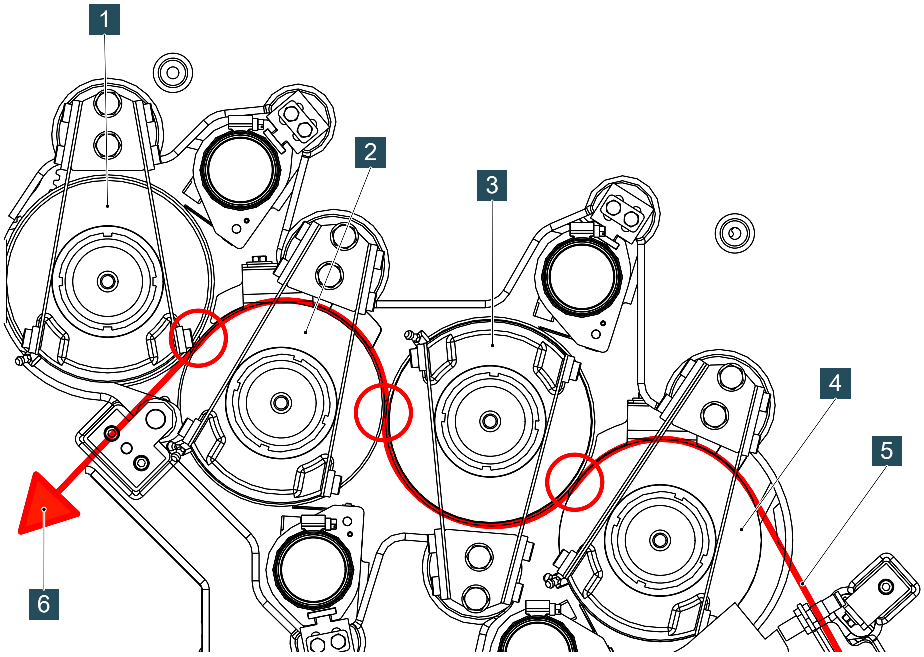


*Figure 21: Calender module*

The calender module has 4 calender rollers 1, 2, 3, and 4. The calender rollers compress and transport the batt 5 in the flow direction 6.

The work principle of the calender rollers 1, 2, 3, and 4 is as follows:

- The calender roller pushes the next calender roller by the pneumatic load.
- The 4 calender rollers make the batt 5 move in a curve path (as shown in the figure above).
- The 4 calender rollers compress the batt 5 3 times at the circle area (as shown in the figure above).

### 3.4.4 Lap Disks

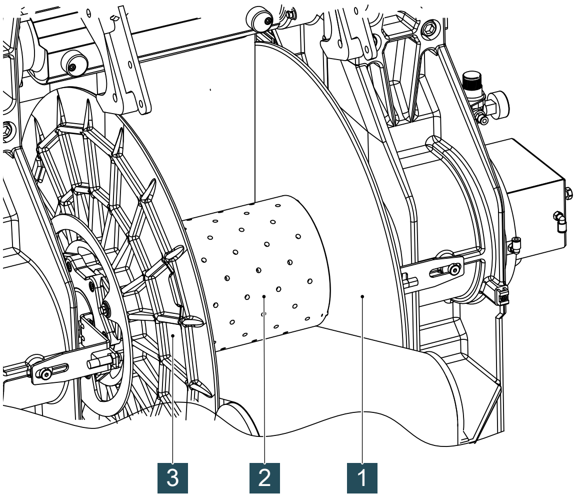


*Figure 22: Lap disks*

The functions of the lap disks 1 and 3 are as follows:

- Tube centering
- Tube clamping
- Lap making

The work principles of the lap disks 1 and 3 are as follows:

- The lap disks are attached and moved axially.
- The lap disks are opened and are closed by the pneumatic force.
- If the lap disks close, the tube 2 is held between the center positions of the 2 lap.
- If the lap disks open, the tube 2 is released and the tube gripper holds the tube 2.

### 3.4.5 Lap Compression

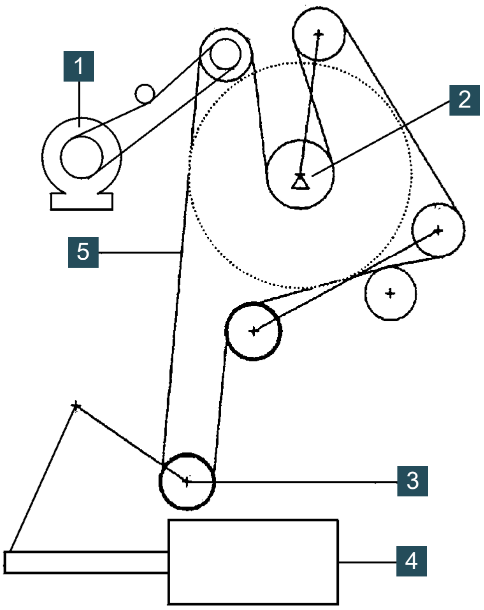


*Figure 23: Lap compression*

| | | | |
|---|---|---|---|
| 1 | Motor | 2 | Lap |
| 3 | Tension lever roller | 4 | Pneumatic cylinder |
| 5 | Lap belt | | |

The motor 1 operates the lap belt 5. When the lap belt 5 operates, the lap 2 is made in the procedure.

The pneumatic cylinder 4 gives tension to the lap belt 5 through the tension lever roller 3. When the lap diameter increases, the pneumatic cylinder 4 gives the different pressure to change the lap density. The operator can set the pressure in the operating unit.

When the lap diameter increases, the lap density is different because the pneumatic cylinder 4 gives the different pressure in the procedure.

### 3.4.6 Fiber Separator

The fiber separator is used for separating the fibers from the lap head and the longitudinal section.

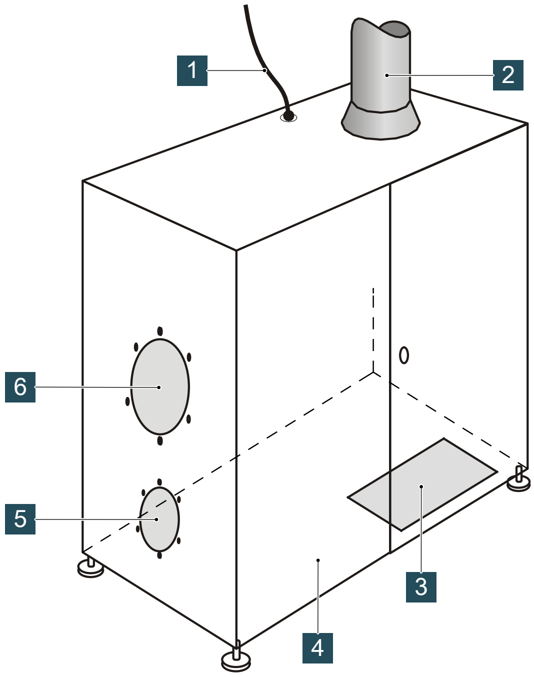


*Figure 24: Fiber separator*

| | | | |
|---|---|---|---|
| 1 | Electrical connection to UNIlap | 2 | Air access through main pipe |
| 3 | Cover | 4 | Waste storage space |
| 5 | Connection opening for waste transport | 6 | Connection opening for exhaust air |

| Options of Fiber Separator | Explanation |
|---|---|
| Into the room | The opening 6 closes. The exhaust air goes out through the cover 3. |

*Table 3:* Pipe connection for exhaust air

| Options of Fiber Separator | Explanation |
|---|---|
| Pointed down | The exhaust air flows away through the opening 6. Then the air goes down in a pipe connected with the opening 6. |

*Table 4:* Pipe connection for exhaust air

| Options of Fiber Separator | Explanation |
|---|---|
| Pointed up | Exhaust air goes away through the opening 6 upwards. Then the air goes up in a pipe connected with the opening 6. |

*Table 5:* Pipe connection for exhaust air

| Options of Fiber Separator | Explanation |
|---|---|
| Manual | The opening 5 closes. The waste is removed manually from the waste chamber 4. |

*Table 6:* Waste removing

| Options of Fiber Separator | Explanation |
|---|---|
| Top | The waste is removed from the waste chamber 4 with top external system of the waste transport. |

*Table 7:* Waste removing

| Options of Fiber Separator | Explanation |
|---|---|
| Below | The waste is removed from the waste chamber 4 with below external system of the waste transport. |

*Table 8:* Waste removing

## 3.5 Technical Data

The information about the technical data is for a standard machine.

### 3.5.1 Performance Properties

| Property | Specification |
|---|---|
| Maximum winding speed | 230 m/min |
| Lap change duration | 30 seconds |
| Machine efficiency | ~ 90 % |
| Doubling | 24 – 28 fold |
| Sliver weight | 3.7 – 6.0 ktex |

*Table 9:* Production factors

| Batt Weight (ktex) | Maximum Rate (kg/h) |
|---|---|
| 80 | 620 |
| 75 | 580 |
| 70 | 540 |
| 65 | 505 |
| 60 | 465 |

*Table 10:* Production rate

| Property | Specification |
|---|---|
| Batt weight | 60 – 80 ktex |
| Maximum lap weight (net) | 24.4 kg |
| Tube weight | 2 kg |
| Lap diameter maximum | 580 mm |
| Lap width | 300 mm |

*Table 11:* Lap data

## 3.5.2 Dimensions

This section contains the information of the dimensions of the machine.

All dimensions are given in matrix unit: mm.

### Dimensions of the Machine (Can Diameter: 600 mm)

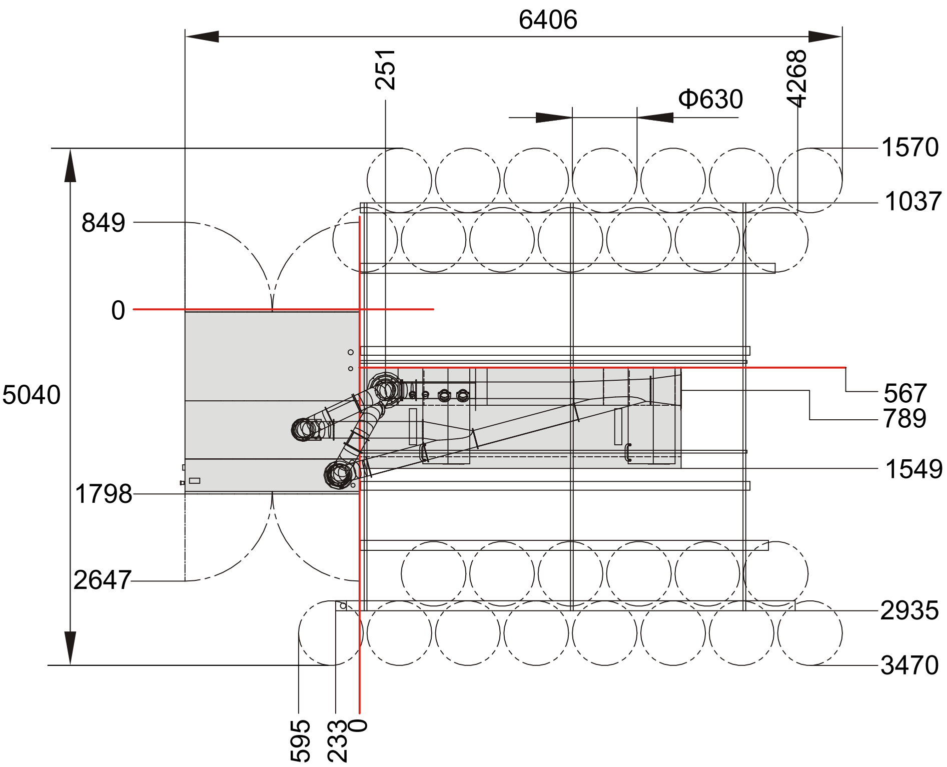

6406
251
Φ630
4268
1570
1037
849
0
5040
567
789
1549
1798
2647
2935
3470
595
233
0

*Figure 25: Dimensions of the machine (can diameter: 600mm)*

## Dimensions of the Machine (Can Diameter: 1000 mm)

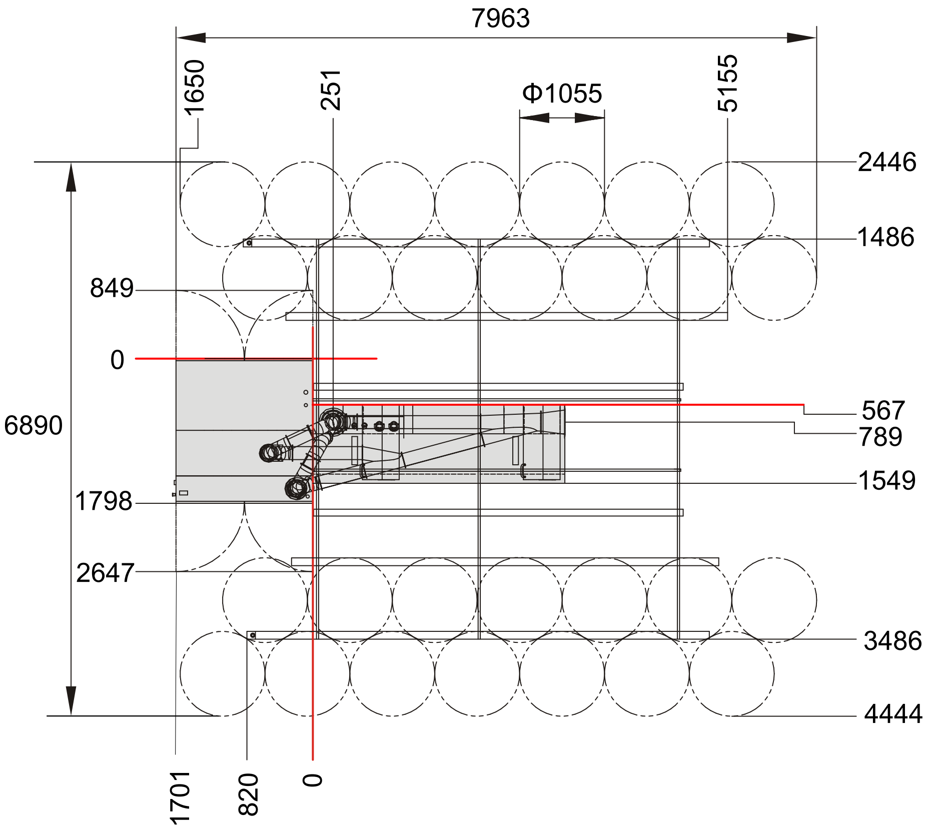

7963
1650
251
Φ1055
5155
2446
1486
849
0
567
789
6890
1549
1798
2647
3486
4444
1701
820
0

*Figure 26: Dimensions of the machine (can diameter: 1000mm)*

### Dimensions of the Fiber Separator

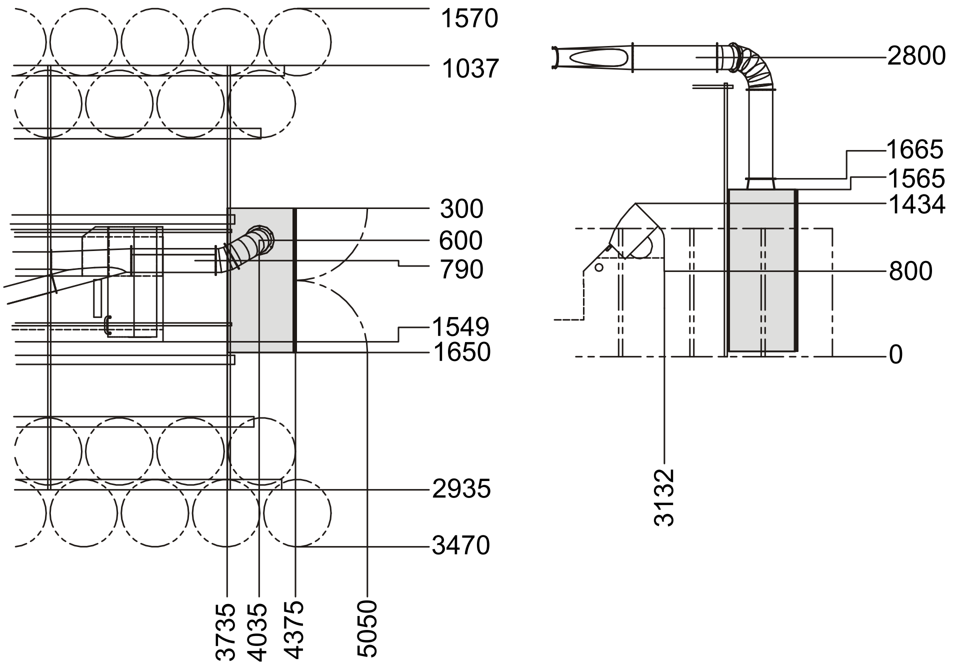

1570
1037
300
600
790
1549
1650
2935
3470
3735
4035
4375
5050
2800
1665
1565
1434
800
0
3132

*Figure 27: Dimensions of the fiber separator (with the pipe pointed up)*

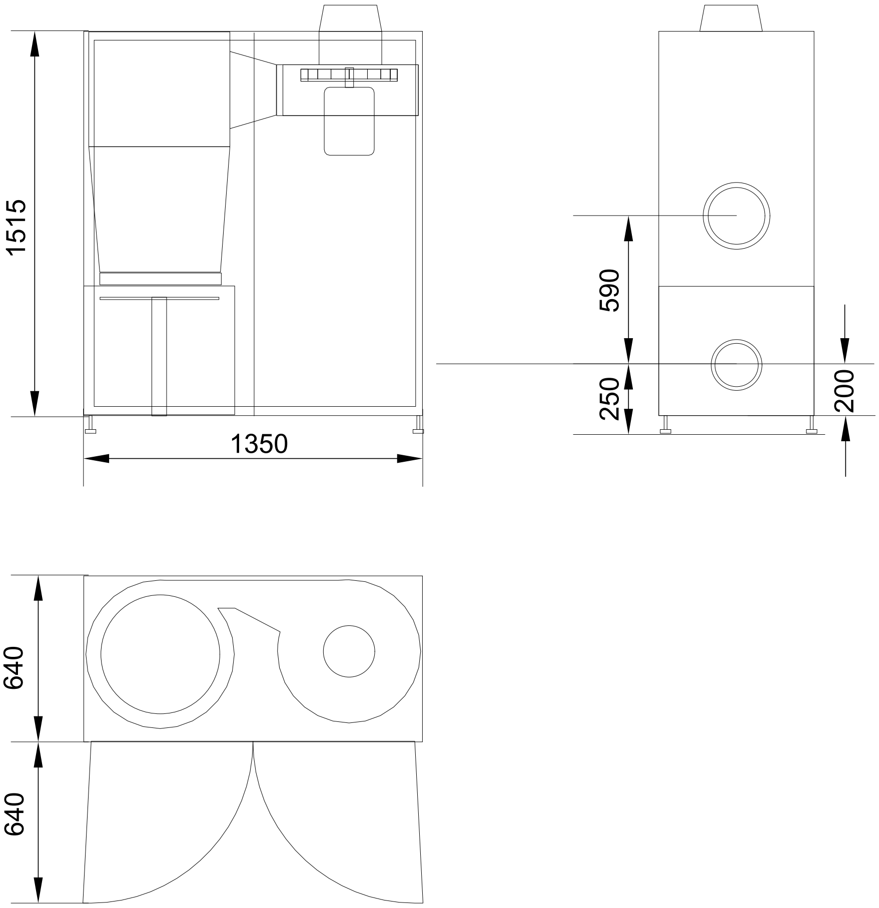

1515
1350
590
250
200
640
640

*Figure 28: Dimensions of the fiber separator*

## Dimensions of the SERVOtrolley

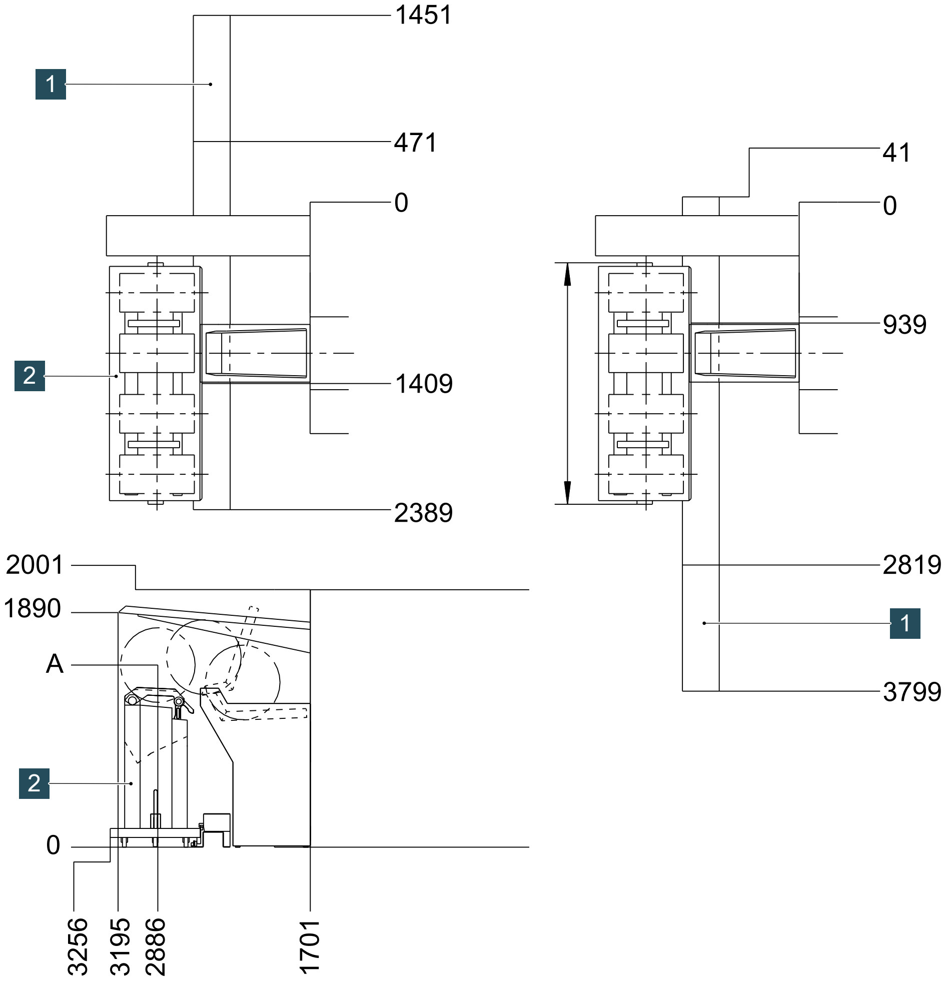

1451
1
471
41
0
0
939
2
1409
2389
2001
2819
1890
1
A
3799
2
0
3256
3195
2886
1701

*Figure 29: Dimensions of the SERVOtrolley*

| | | | |
|---|---|---|---|
| 1 | Guide for lap trolley | 2 | Lap trolley |

| SERVOtrolley Type | Value of the Height A |
|---|---|
| E16 | 1415 |
| E17 | 1515 |

*Table 12:* The value of the height A

## Dimensions of the SERVOmag

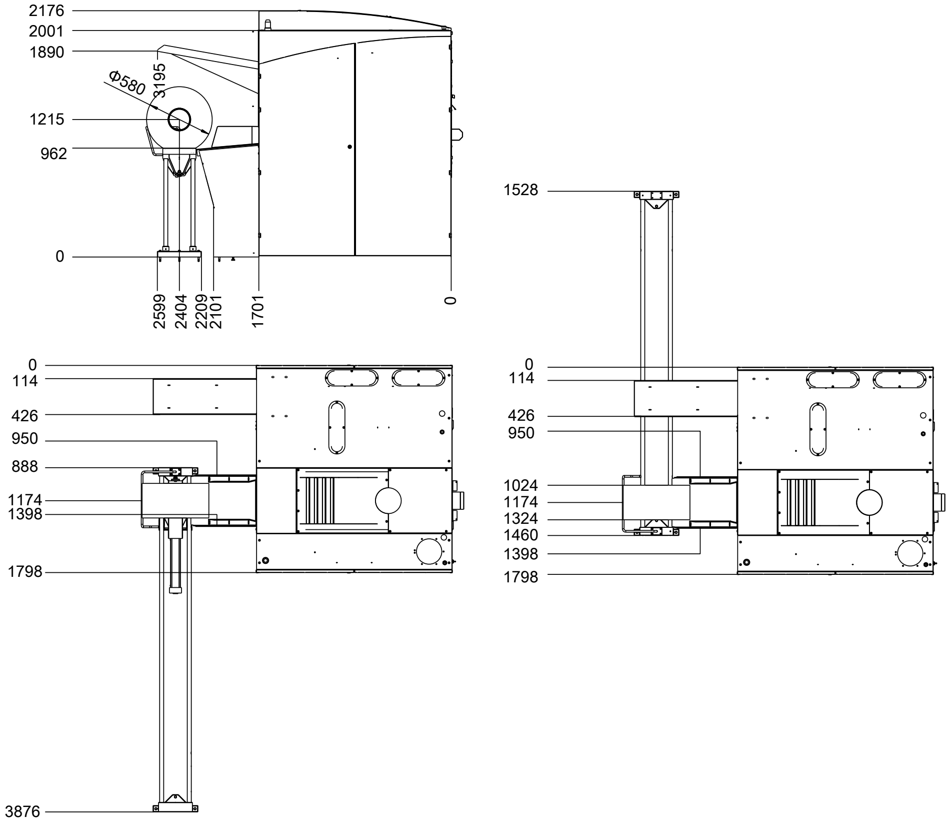

2176
2001
1890
Φ580
3195
1215
962
0
2599
2404
2209
2101
1701
0
1528
0
114
426
950
888
1174
1398
1798
3876
0
114
426
950
1024
1174
1324
1460
1398
1798

*Figure 30: Dimensions of the SEVOmag*

## Dimensions of the SERVOlap

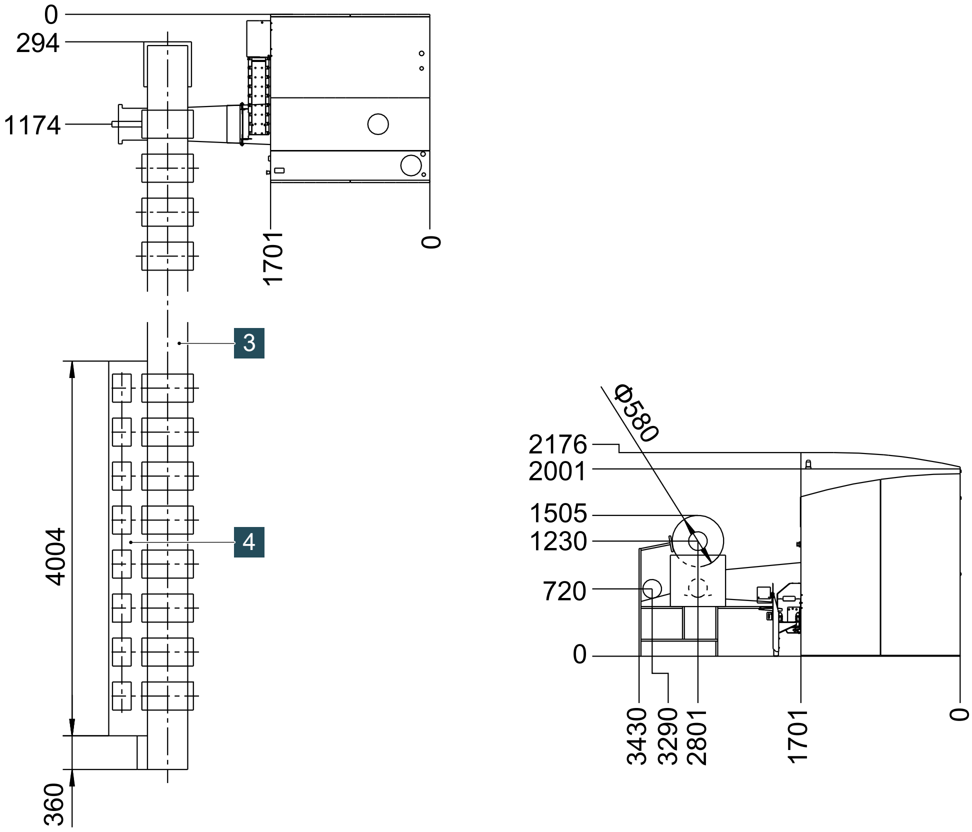

0
294
1174
1701
0
3
4
4004
360
Φ580
2176
2001
1505
1230
720
0
3430
3290
2801
1701
0

*Figure 31: Dimensions of the SERVOlap*

| | | | |
|---|---|---|---|
| 3 | Cross conveyor | 4 | Tube carrier |

### Dimensions of the Exhaust-Air Connection

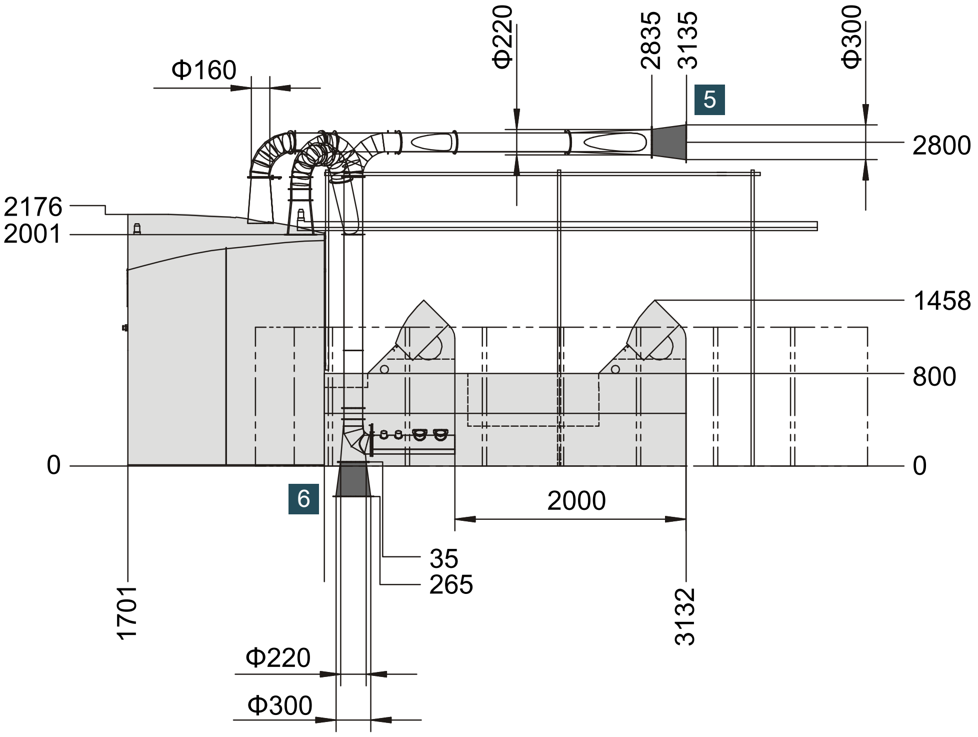

Φ160
Φ220
2835
3135
Φ300
5
2800
2176
2001
1458
800
0
0
6
2000
35
265
1701
3132
Φ220
Φ300

*Figure 32: Dimensions of the exhaust-air connection*

| | |
|---|---|
| **5** Pointed up Piping for exhaust-air | **6** Pointed down piping for exhaust-air |

## 3.5.3 Weights

| Section Name | Weight (kg) |
|---|---|
| Lap head | 3300 |
| Longitudinal section | 500 |
| Feed frame | 150 |
| Fiber separator | 100 |

*Table 13:* Weights of the machine sections

## 3.5.4 Sound Emission

The conditions for measuring the sound emissions are as follows:

- With material
- With fiber separator
- Longitudinal section with 2 drafting systems
- Batt weight: 79 g/m

- With lap trolley

| Delivery Rate (m/min) | LWAd (dB) |
|---|---|
| 150 | 93 + 3 |
| 180 | 94 + 3 |
| 230 | 95 + 3 |

*Table 14:* A-weighted noise power (referenced power: 1 pW)

| Delivery rate (m/min) | LpAd (dB) |
|---|---|
| 150 | 74 + 3 |
| 180 | 75 + 3 |
| 230 | 76 + 3 |
| During a tube change | 85 dB |

*Table 15:* A-weighted noise power (referenced power: 20 µPa)

**The information that follows is about measurement.**

- Measurement standard: ISO 9902
- Measuring distance: 1 m
- Levels expressed in the method: Lm + K, Lm: typical mean value, K = 3 dB (safety margin)
- Date of measurement: 4/8/2015

### 3.5.5 Exhaust Air

| Property | Specification |
|---|---|
| Minimum vacuum | 1000 Pa |
| Volume of the exhaust air | 0.8 $m^3/s$ |
| Pipe diameter of the exhaust air | 300 mm |
| Pipe connection for the exhaust air | Pointed down or pointed up |

*Table 16:* Exhaust air data

### 3.5.6 Compressed Air

| Property | Specification |
|---|---|
| Minimum network pressure (P) | 8.0 bars |
| Air consumption rate | 16.5 $Nm^3/h$ |
| Standard | ISO 8573-1 |
| Maximum contamination density | 5 $mg/m^3$ |
| Maximum permitted dimension of the contamination particle | 5.4 µ |
| Solid contamination class | 3 |

| Property | Specification |
|---|---|
| Maximum oil in the incoming air | 1.0 mg/m³ |
| Oil content class | 4 |

*Table 17:* Data of compressed air

## 3.5.7 Electrical Power

The user can refer to the electrical manual for the information about the electrical power.

## 3.5.8 Floor Requirements

### Requirement of the Floor Structure

The structure requirement of the floor on which the machine is installed is shown in the figure that follows. The floor structure must obey the regulations related to the floor structure Z0044.

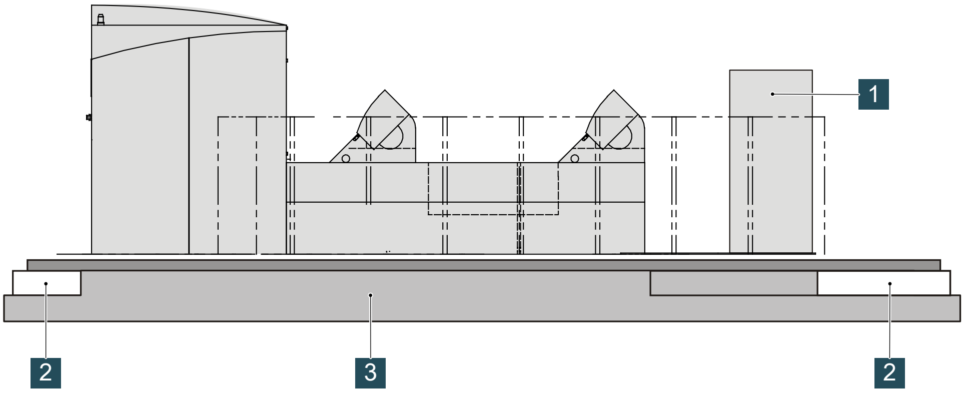


*Figure 33: Floor requirement*

| | | | |
|---|---|---|---|
| 1 | Fiber separator | 2 | Sand, asphalt, or other soft bottom |
| 3 | Concrete | | |

### Requirement of the Floor Load

Minimum load-bearing capacity: 10 600 N/m²

### 3.5.9 Technical Definitions and Formulas

#### Nipping Surface Distance

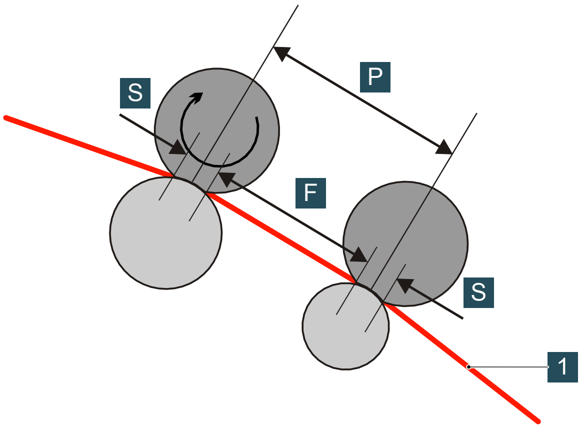


*Figure 34: Nipping surface distance*

The fibers **1** are always held between the rubber surfaces of the top rollers of a drafting system. A load is applied to the top rollers, and then the top rollers push the bottom rollers. The nipping surfaces are made in the procedure.

The dimension **S** of the nipping surface is related to the items that follow:

- Load on the drafting system
- Hardness of the rubber
- Diameter of the roller
- Mass of the fiber

The nipping surface has no accurate limit. Rather, the closer the fiber end is at the nipping point, the more the friction forces having an effect on the procedure that the fibers increase.

The nipping surface distance **F** is the distance between the nipping surfaces. The nipping surface distance **F** is related to the draft distances.

The nipping surface distance **F** cannot be smaller than the length of the longest fiber.

#### Nipping Line Distance

The nipping line distance **P** is also known as the nipping point distance, and is always more than the nipping surface distance **F**.

In the textile making procedure, the fiber mesh is frequently nipped by 1 element and moved to a second one. This second element moves the fiber mesh faster.

The distance between these 2 nipping lines is the nipping line distance **P**. Other names of the nipping line distance **P** are nipping point distance or draft distance.

The nipping line distance P is the nominal distance. The other OMEGAlap can be set in accordance with the adjustment of the drafting system. The nipping surface distance F is the important value to get the best distance of the nipping line.

The formulas for calculating the nipping line distances are as follows.

HVD = P – 42

| Name | Explanation |
|---|---|
| P | Nipping line distance (mm) |
| 42 | Minimum nipping line distance (mm) |
| HVD (main draft) | Check gauge dimension (mm) |

VVD = P – 44

| Name | Explanation |
|---|---|
| P | Nipping line distance (mm) |
| 44 | Minimum nipping line distance (mm) |
| HVD break draft | Check gauge dimension (mm) |

## Output Draft

The output draft is the draft between the delivery rollers of the drafting system and the table calender cylinders.

## Draw-Frame Sliver

The draw-frame sliver collects the fibers in the longitudinal direction. Many draw-frame slivers are drafted out by the drafting system to make a web.

## Web

The web is made of the fibers that come out of the drafting system.

The web from the front drafting system is on the web from the rear drafting system. The overlap webs make the batt.

## Batt

The batt contains 2 webs, and is wound onto the tube to make the lap.

## Break Draft

The break draft pulls the fiber mass with a small force. Then the fibers are aligned to become ready for the subsequent main draft.

## Main Draft

The main draft pulls the fiber mass and then the fibers are aligned.

### Total Draft

The total draft has the break draft and the main draft in the drafting system.

The formula about the total draft is as follow:

GV = (A x B) / C

| Name | Explanation |
|---|---|
| GV | Total draft |
| A | Doubling number of slivers at feed |
| B | Sliver weight (g/m) |
| C | Set batt weight (g/m) |

### Correction to the Total Draft of the Drafting System

The formula about the correction to the total draft of the drafting system is as follow:

GV = [C (m) x GV (m)] / C

| Name | Explanation |
|---|---|
| GV | Target total draft |
| GV (m) | Actual total draft |
| C | Set batt weight (g/m) |
| C (m) | Actual batt weight (g/m) |

### Fiber Count

The formula that follows is about the fiber count.

F = (b x 25400) / mic

| Name | Explanation |
|---|---|
| b | Batt weight |
| F | Fiber count |
| mic | Micronaire |

### Batt Weight

The batt weight is related to the fiber mass as it is put in and the total draft.

The formula of the batt weight is as follow:

b = (F x mic) / 25400

| Name | Explanation |
|---|---|
| b | Batt weight |
| F | Fiber count |
| mic | Micronaire |

## Machine Efficiency

Machine efficiency shows the availability of the machine in percentage. The value is the proportion of the machine ready for production to the total time.

The machine efficiency is decreased only by internal machine faults such as wound material and motor protection switches. Operator intervention and standstill do not decrease the machine efficiency.

A machine efficiency of 100 % is possible for all machines.

The formula about the machine efficiency is as follow:

MN = (A + B) / (A + B + D)

| Name | Explanation |
|---|---|
| MN | Machine efficiency |
| A | Productive time in production mode |
| B | Unproductive time in production mode |
| D | Fault time |

## Production Efficiency

The production efficiency shows the ratio of the actual production of a machine to the possible target production in theory of a machine. All influences must be thought in reference to the procedure.

Different from the machine efficiency, the downtime machine off must be thought when calculating the production efficiency.

PN = A / T

| Name | Explanation |
|---|---|
| PN | Production efficiency |
| A | Productive time in production mode |
| T | Total time |

## MTBA

The MTBA is the abbreviation of mean time between assists. The MTBA shows the average run time in the production mode before the machine is stopped because of the machine internal problem.

Subsequent stoppage that occurs in the next 30 seconds does not have an effect on the MTBA. External disturbances and intentional stoppages also do not have an effect on the MTBA. The planned stoppage is calculated in MTBA.

MTBA = (A + B) / S

| Name | Explanation |
|---|---|
| A | Productive time in production mode |
| B | Unproductive time in production mode |

| Name | Explanation |
|---|---|
| S | Number of stoppages because of internal faults |

## 3.6 Identification Plate

The identification plate is near the main switch (near the main power supply).

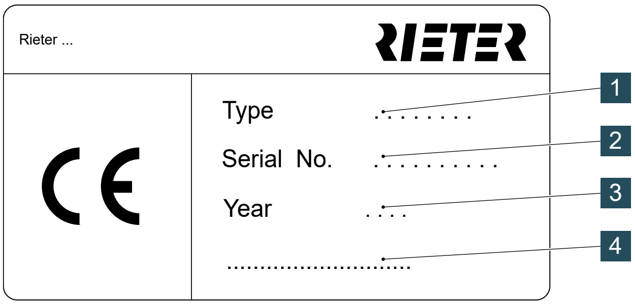


*Figure 35: Identification plate*

| | | | |
|---|---|---|---|
| 1 | Machine type | 2 | Serial number |
| 3 | Year of manufacture | 4 | Optional information with basic parameters of supplied energies, for example, the power supply and the compressed-air requirement |

## 3.7 Doors and Hoods

The doors and hoods at the machine are shown in the figure that follows.

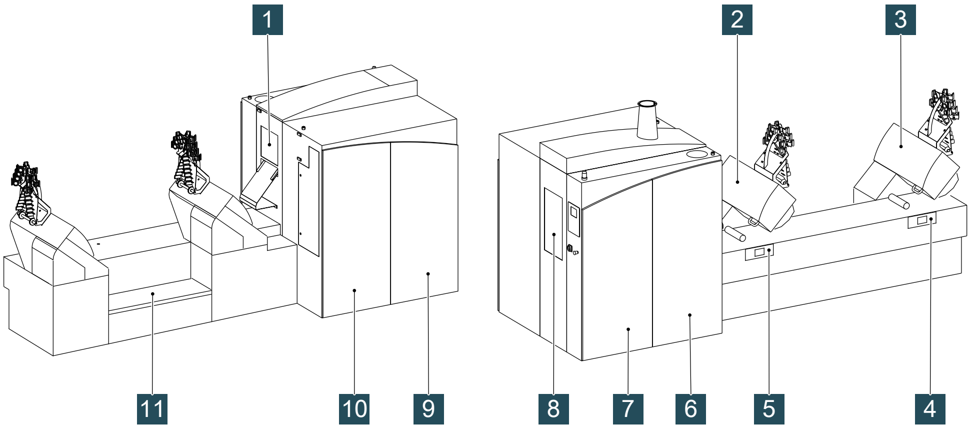


*Figure 36: Doors and hoods*

| | | | |
|---|---|---|---|
| 1 | Infeed door | 2 | Front hood of the drafting system |
| 3 | Rear hood of the drafting system | 4 | Rear insert housing |

| | | | |
|---|---|---|---|
| 5 | Front insert housing | 6 | Right side door B |
| 7 | Right side door A | 8 | Delivery door |
| 9 | Left side door A | 10 | Left side door B |
| 11 | Storage cover of the pulleys | | |

## Doors and Hoods with Locks

The machine has doors and hoods with locks. The twist locks prevent the doors and the hoods from accidental openings. The operator opens and closes the doors and the hoods with the tri-angular key.

The doors and the hoods with locks are as follows:

- Left side door A 9
- Left side door B 10
- Right side door A 7
- Right side door B 6

The machine cannot operate if one of the above doors is open.

## Doors and Hoods without Locks

The machine also has doors and hoods without locks. No key is necessary to open and close the doors and the hoods.

The doors and the hoods without locks are as follows:

- Infeed door 1
- Delivery door 8
- Front hood of the drafting system 2
- Rear hood of the drafting system 3
- Front insert housing 5
- Rear insert housing 4
- Storage cover of the pulleys 11

**Infeed door 1** The infeed door opens if the operator turns the rotary switch to the right position. The infeed door closes if the operator turns the rotary switch back to the initial position.

**Delivery door 8** The delivery door opens in one of the 2 conditions that follow:

- The delivery door opens automatically if the lap in the lap head is ready to be sent out.
- The delivery door opens manually if the operator taps the program key [Open Delivery Door] on the operating unit.

**Front/Rear hood of the drafting systems 2 3** The machine cannot start if the front hood or the rear hood of the drafting system is open.

**Front/Rear insert housings** 4 5 The front and rear drawers have the wipers for the bottom table calenders. The machine cannot start if one of the 2 drawers is open.

## 3.8 Machine Requirements

The information that follows is the machine requirements.

### Raw Material

| Maximum Fiber Staple Length | Material |
|---|---|
| 57 mm | Cotton only |

### Tube

Only tubes with Rieter date stamp 1 are permitted to be used on the machine.

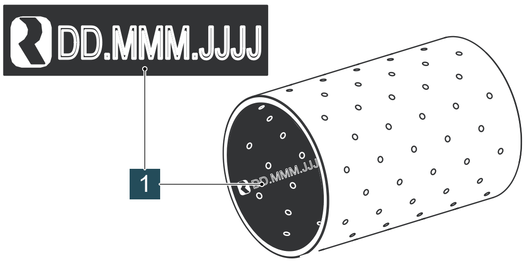


*Figure 37: Tube*

### 3.8.1 Rubber Cots of the Top Rollers

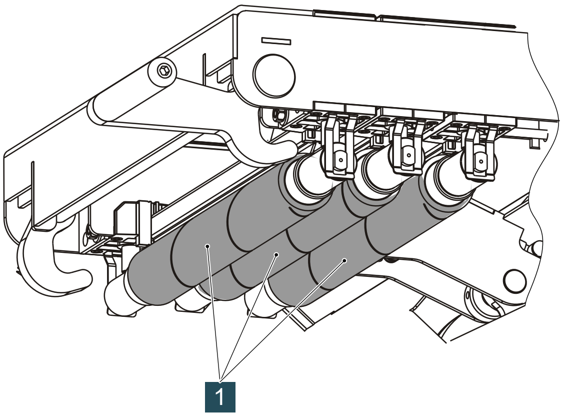


*Figure 38: Rubber cots of the top rollers*

Because the rubber cots 1 of the top rollers are wearing parts, so the spare parts are necessary to be kept.

## Necessary Maintenance Equipment and Tools

| Equipment Name | Description |
|---|---|
| Hydraulic press machine | The rubber cots are installed or removed by the machine. |
| Circular grinder | The rubber cots are necessary to be ground after a specified working interval. |
| Option 1 of the silicon grinding disk | SIC 80 high precision |
| Option 2 of the silicon grinding disk | SIC 80 - H11 - V (grain 80, hardness H, structure 11, type of bonding V) |

*Table 18:* Maintenance equipment and tools for the rubber cots of the top roller

## Dimensions of the Top Roller

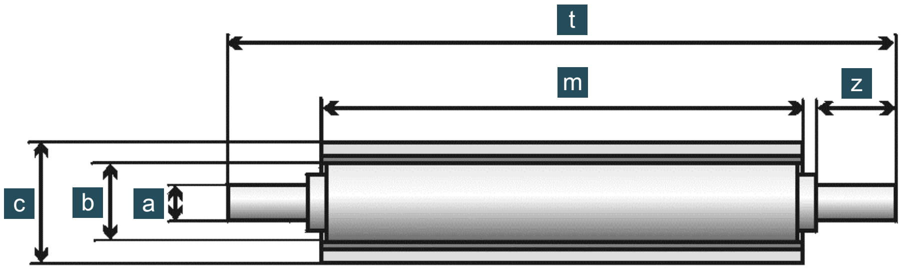


*Figure 39: Dimensions of the top roller*

| Dimension Name | Dimension (mm) |
|---|---|
| Length of core t | 411 |
| Length of coat m | 300 |
| Length of peg z | 23 |
| New outside diameter c | 39 |
| Core diameter b | 26 |
| Peg diameter a | 15 |

*Table 19:* Dimensions of the top roller

## Requirement of the Worn Cot

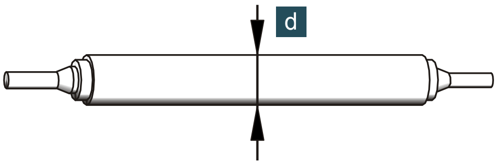


*Figure 40: Diameter of the top roller*

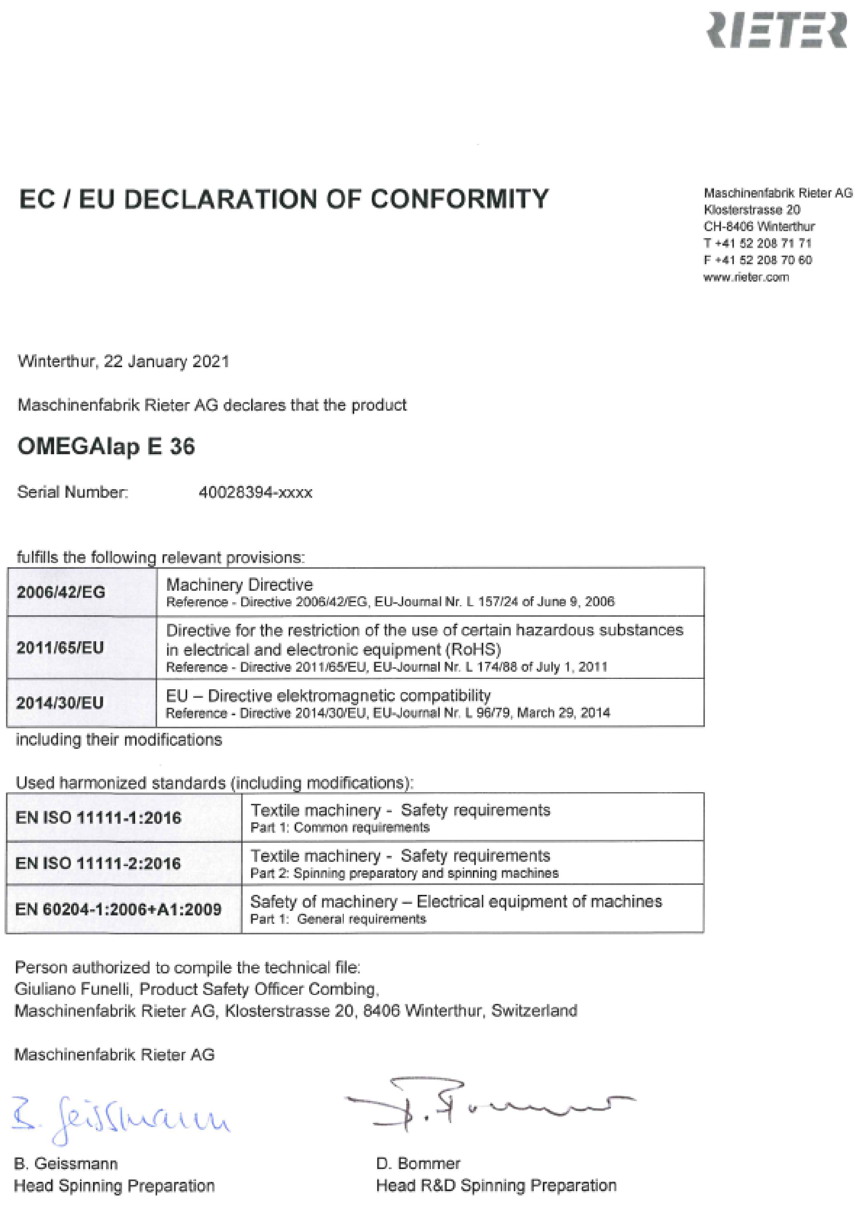
The minimum diameter d of the worn cot is 36 mm. If the diameter of a worn cot is less than 36 mm, the worn cot should be replaced with a new cot.

## Properties

| Characteristic | Specification |
|---|---|
| Manufacturer | Armstrong J-490 |
| Hardness | 85 ShA |
| Color | Gray |
| Surface quality | Fine and without hairline cracks |

*Table 20:* Properties of the rubber cots of the top roller

## 3.9 EC/EU Declaration of Conformity



RIETER

# EC / EU DECLARATION OF CONFORMITY

Maschinenfabrik Rieter AG
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www.rieter.com

Winterthur, 22 January 2021

Maschinenfabrik Rieter AG declares that the product

**OMEGAlap E 36**

Serial Number: 40028394-xxxx

fulfills the following relevant provisions:

| | |
|---|---|
| **2006/42/EG** | Machinery Directive<br>Reference - Directive 2006/42/EG, EU-Journal Nr. L 157/24 of June 9, 2006 |
| **2011/65/EU** | Directive for the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)<br>Reference - Directive 2011/65/EU, EU-Journal Nr. L 174/88 of July 1, 2011 |
| **2014/30/EU** | EU – Directive elektromagnetic compatibility<br>Reference - Directive 2014/30/EU, EU-Journal Nr. L 96/79, March 29, 2014 |

including their modifications

Used harmonized standards (including modifications):

| | |
|---|---|
| **EN ISO 11111-1:2016** | Textile machinery - Safety requirements<br>Part 1: Common requirements |
| **EN ISO 11111-2:2016** | Textile machinery - Safety requirements<br>Part 2: Spinning preparatory and spinning machines |
| **EN 60204-1:2006+A1:2009** | Safety of machinery – Electrical equipment of machines<br>Part 1: General requirements |

Person authorized to compile the technical file:
Giuliano Funelli, Product Safety Officer Combing,
Maschinenfabrik Rieter AG, Klosterstrasse 20, 8406 Winterthur, Switzerland

Maschinenfabrik Rieter AG

B. Geissmann

B. Geissmann
Head Spinning Preparation

D. Bommer
Head R&D Spinning Preparation

*Figure 41: EC declaration of conformity*

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# 4 Packaging and Transportation

This chapter contains information about:

- The general packaging instructions
- The packaging
- The packaging accessories
- The instructions on safe machine transport

## 4.1 Packaging and Transportation Personnel

Only Rieter-approved personnel are permitted to:

- Remove the packaging material or put the machine in the packing material
- Remove the machine from the material boxes or the transportation pallets
- Install the machine in the material boxes or on the transportation pallets

## 4.2 Liability for Unloading and Transportation

The customer is liable for the transportation to the installation site and the temporary storage. The customer is liable to remove the machine components from the trucks at the installation site.

The installation personnel do not move machine components to the installation site or remove components from the trucks at the installation site. In the case that instructions from the installation personnel are necessary, the installation personnel is not responsible for damage that occurs.

## 4.3 Removing the Packaging Material

1. Do not keep the material boxes in a cold room before the packaging material is removed. Keep the machine and the components in the packaging material in the installation location for minimum 24 hours.
2. Open the material boxes.
3. Remove the packaging material and the drying agents.
4. Examine if the machine or parts of the machine got damage during the transport.
5. If machine damage occurred, the personnel must tell the customer to give a report to the insurance office.
6. To examine the contents of the material boxes for missing parts, use the packing list.
7. If the material boxes do not contain all parts, the personnel must tell the customer to give a report to Rieter.
8. Remove the transport locks from the material boxes and the transportation pallets.

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# 5 Installation

This chapter contains information about:

- The necessary installation conditions
- The necessary installation personnel

## 5.1 Floor Condition

### Floor Structure

Only approved personnel can make a layout plan of the floor structure. The Rieter machine layout with the floor load of each machine foot is to be obeyed.

**NOTICE**

**Machine vibration during operation**

If the floor structure is not stable and not flat, the machine is possible to be damaged.

▶ Consider both the accepted load, and the floor structure below the machine feet.

Soft materials such as slag, sand, and asphalt are not to be used as an intermediate layer 2. If soft materials are used, also with a low vibration level the load that is applied by the machine feet can move the intermediate layers 2.

As an example the figure shows machines that are on a not applicable floor structure and on an applicable floor structure.

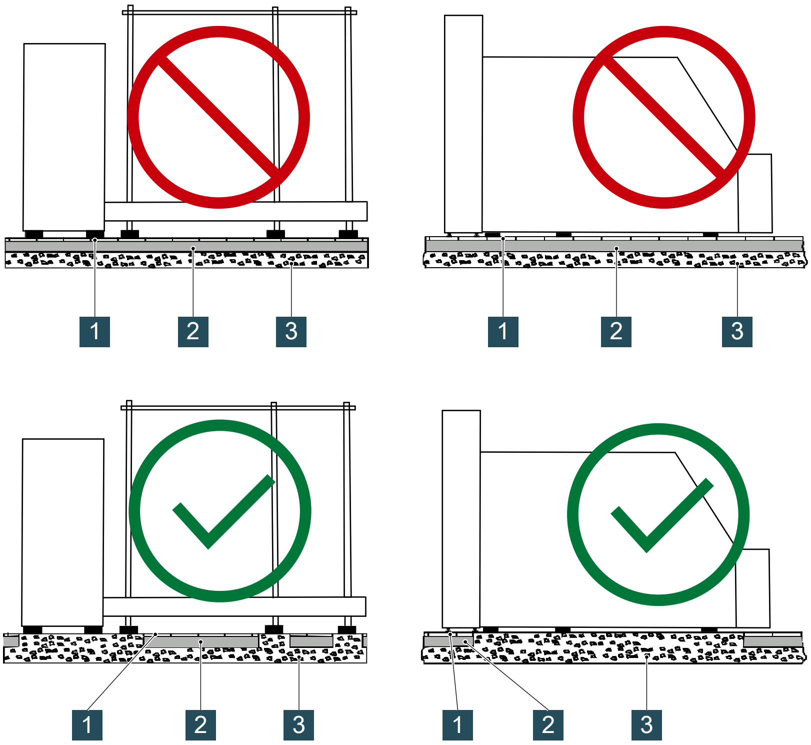


*Figure 42: Examples of floor structures*

| | | | |
|---|---|---|---|
| 1 | Flooring | 2 | Intermediate layer |
| 3 | Concrete substrate | | |

Flooring 1 such as clinker, concrete slabs, or hard surfaces are not to be installed on the intermediate layers 2 that are made of slag, sand, and asphalt. To have a horizontal surface, a minimum of the area of the machine feet is to be filled with concrete substrate 3.

If a wooden floor is used, support plates are to be installed below the machine feet. The load of the machine feet is to be divided to a larger area with the support plates.

Rieter accepts no liability for machine damage that is caused because the incorrect floor structure was used.

## Floor Surface Properties

The floors must have the properties that follow:

- Not aggressive to metals
- High abrasion resistance
- High compressive strength
- Slip-resistant
- Hard and tough, non-ceramic

- Resistant to
  - Oils
  - Fuel
  - Acids
  - Alkalis

### Level and Evenness of the Floor

| | |
|---|---|
| For each running meter | ±4 mm |
| For each 4 m | ±10 mm |

## 5.2 Installation Requirements for the Customer

The customer:

- Must give instructions about the danger zones of the installation site
- Must tell the installation personnel about the site-specific safety regulations
- Must make sure of the site-specific safety
- Must install the necessary rails
- Must make sure that the training for the installation personnel is done before the installation
- Must make sure that the installation personnel of the customer are not changed during the installation
- Must make sure that the installation personnel have access to the operation manual

## 5.3 Installation Personnel

Only Rieter personnel or Rieter-approved personnel are permitted to install the machine or to do the supervision of the installation.

## 5.4 Preparation

This section contains the information about the preparation for installing the machine.

### 5.4.1 Cleaning the Machine

**Prerequisites** Make sure that the criteria are obeyed:

✓ All the materials are removed from the machine.

1. Clean the machine with agent.

**Result** The machine is cleaned.

### 5.4.2 Cleaning the Installation Location

**Prerequisites** Make sure that the criteria are obeyed:

✓ A brush or a vacuum cleaner is to be used.

1. Remove the crates and the pallets that are with the machine parts.
2. Clean the floor with the brush or the vacuum cleaner.
   ⇨ The floor is as dust-free as possible.

**Result** The installation location is cleaned.

### 5.4.3 Examination of the Installation Space

This section contains the instruction about examining the installation space.

### 5.4.3.1 Making a 90° Angle

This section contains the information about how to make a 90° angle with the largest possible radius.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The floor is cleaned.

✓ 1 measuring cord or 1 measuring rod with 2 points is to be used.

1. Make a straight line 1 on the floor.

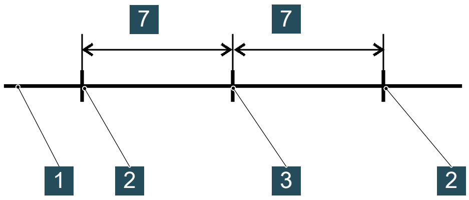


*Figure 43: Guide marks on the straight line*

2. Make an intersection 3 on the straight line 1.
3. Make the guide marks 2 with the possible largest distances 7 on the 2 sides of the intersection 3.
4. Make the circular lines 5 with the measuring cord 4 or the measuring rod 4 with 2 points and start at the 2 guide marks 2 (the radiation of the circular line is 1.5 times of the distance 7).

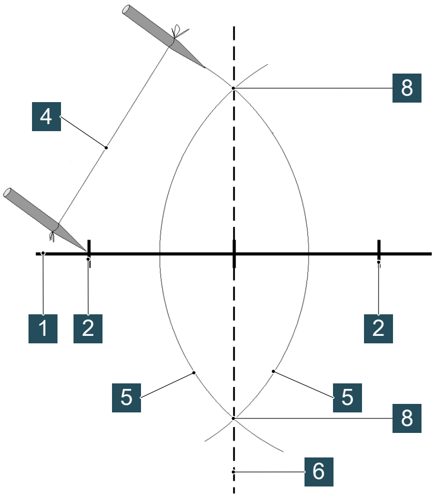


*Figure 44: Vertical line on the straight line*

5. Make the line 6 with the 2 intersections 8 of the circular lines 5.

   ⇨ The perpendicular line of the straight line 1 is made.

6. If necessary, make more lines that are parallel with the line 6.

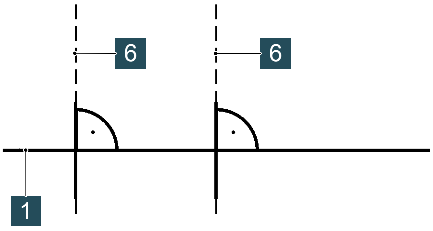


*Figure 45: Parallel lines on the straight line*

**Result** The 90° angle is made.

### 5.4.3.2 Examining the Floor Openings

**Prerequisites** Make sure that the criteria are obeyed:

✓ The floor is clean.

1. Make the reference lines 1 and 3 on the floor.

   ⇨ The 2 lines are the coordinate of other lines.

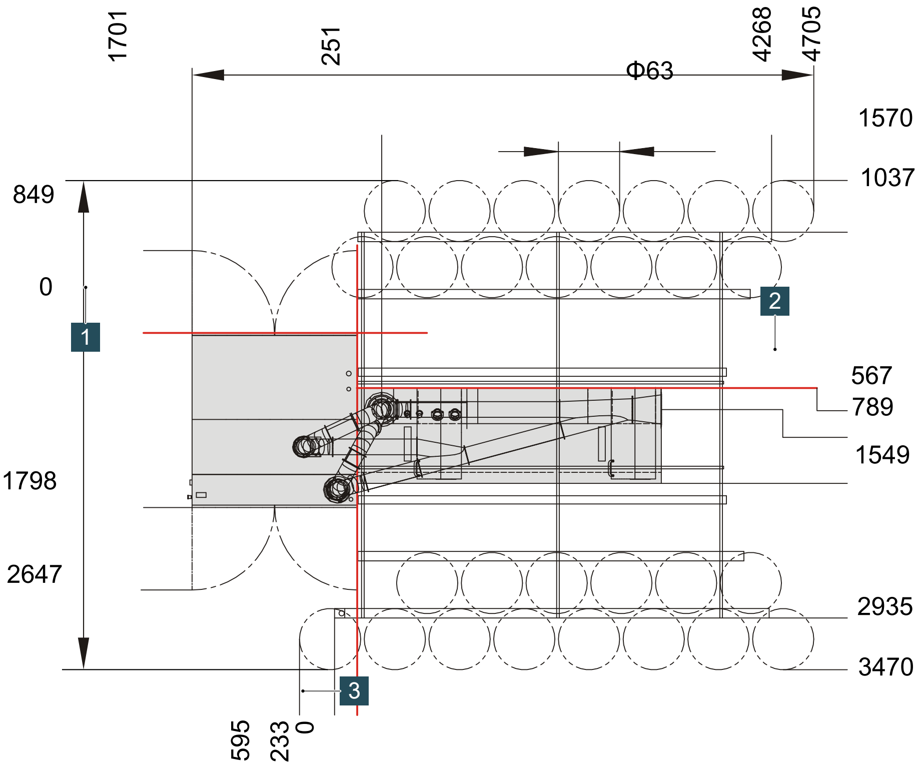

1701
251
Φ63
4268
4705
1570
1037
849
0
1
2
567
789
1549
1798
2647
2935
3470
3
595
233
0

*Figure 46: The top view of the machine*

2. Make the line **2** that is parallel to the reference line **1**.
3. Examine the floor opening **4** for the electrical connection and compressed-air connection in accordance with the dimension on the figure that follows.

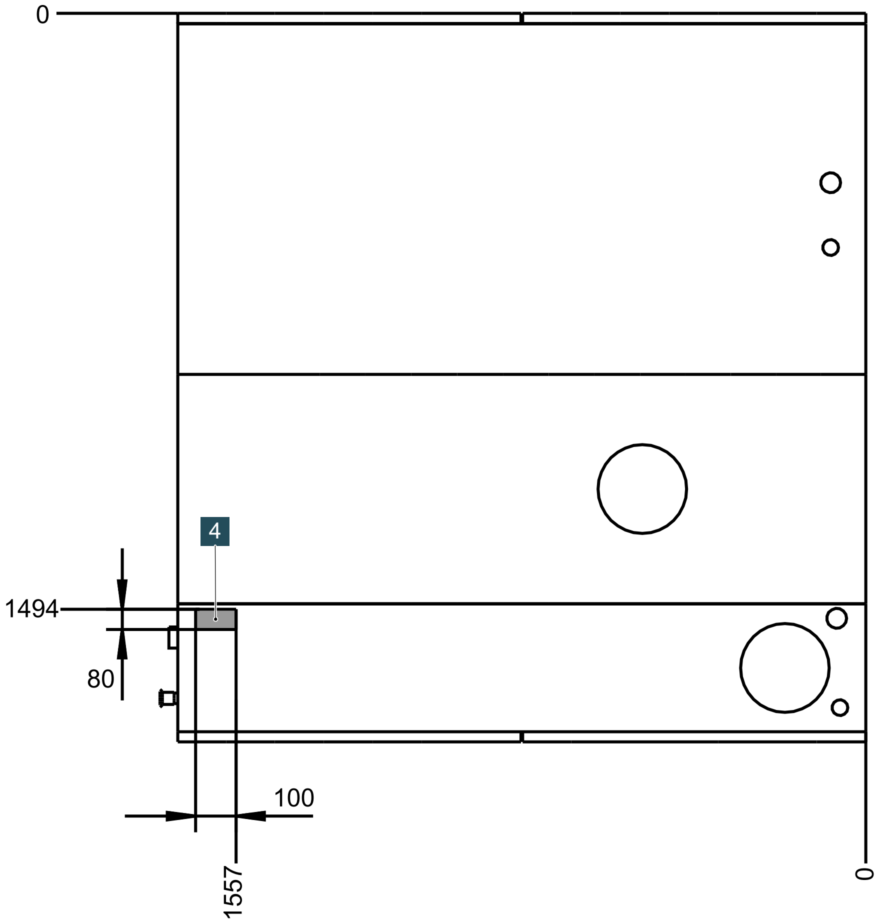


*Figure 47: The top view of the electrical connection and compressed-air connection*

4. Examine the floor opening for the tube 5 of the exhaust air in accordance with the dimension in the figure that follows. (exhaust air upwards)

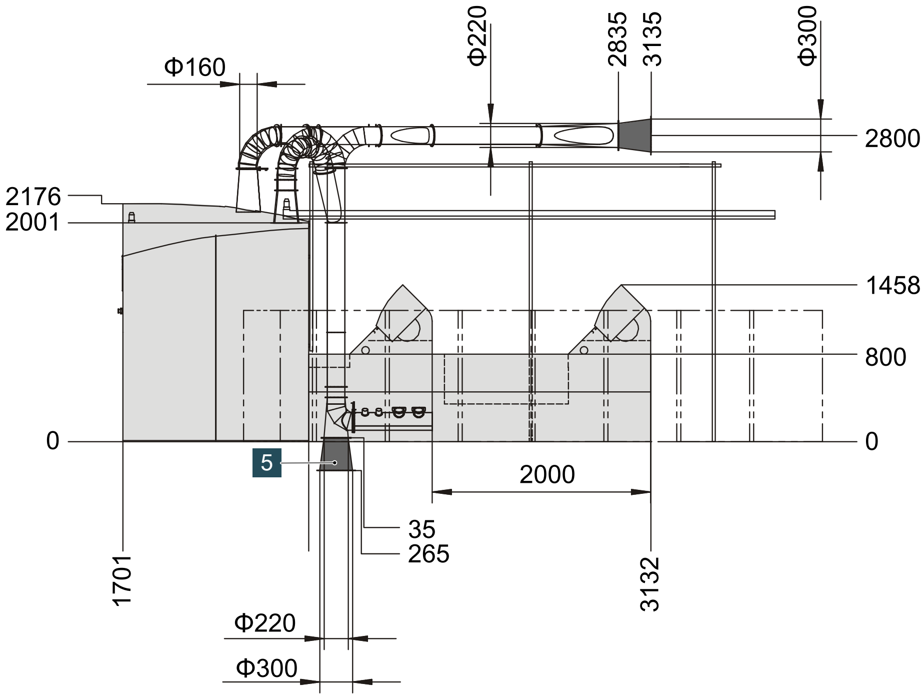


*Figure 48: Side view of the exhaust-air connection*

5. If the floor openings do not follow the requirement, change the machine configuration in accordance with the local situation or change the floor channel structure.

**Result** The floor openings are examined.

### 5.4.3.3 Examining the Floor Construction

**Prerequisites** Make sure that the criteria are obeyed:

✓ 1 piece of hammer or an equivalent object is necessary.

**NOTICE**

**Incorrect floor foundation!**

Damage to the machine if the foundation of the floor below the machine is not sufficiently concrete.

▶ Make sure that the machine is on a concrete floor.

1. Tap the floor below the machine with a hammer or an equivalent object to listen to the sound (the sound that goes back is different between a hollow space and a solid space).
2. Examine if the floor below the machine follows up the requirement that is shown in the floor requirement.

3. If the floor below the machine does not follow up the requirement, tell the project manager.
4. If the floor below the machine follows up the requirement, put the machine above the floor.

**Result** The floor construction is examined.

### 5.4.3.4 Examining If the Floor Is Horizontal

1. Attach a spirit level to a straight edge or use the mason’s spirit level directly.
2. Lift the spirit level 2 to a height with an applicable object 1 from the reference point 3, and make sure that the height is less than 50 mm in accordance with the floor condition.

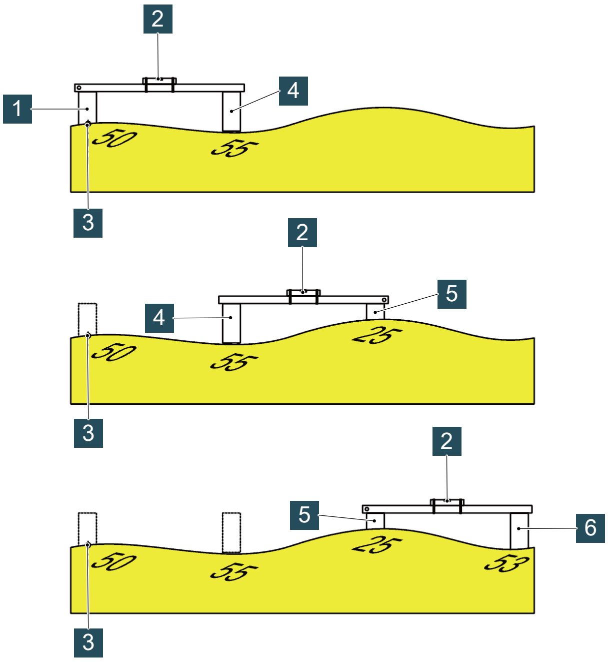


*Figure 49: Floor leveling procedure*

3. Record the height of the object 1.
4. To make the spirit level 2 fully horizontal, put the object 4 below the spirit level 2.
5. Record the height of the object 4.
6. To make 1 end of the spirit level 2 above the third measuring point, turn over the spirit level 2.
7. To make the spirit level 2 fully horizontal, put the object 5 below the spirit level 2.
8. Record the height of the object 5.
9. Record the height of the object 6 with the same procedure of steps 6 and 7.

10. If the height difference between the lowest point and the highest point is not in the tolerances (maximum 4 mm / m and maximum 10 mm / 4 m), make a decision if the machine is possible to be put on the floor.

**Result** The floor is examined on the horizontal situation.

# 6 Commissioning

This chapter contains information about:

- The commissioning personnel
- The recommissioning after a temporary decommissioning

## 6.1 Commissioning Personnel

Only Rieter personnel or Rieter-approved personnel are permitted to do the commissioning of the machine or to do the supervision of the commissioning.

## 6.2 Recommissioning after a Temporary Decommissioning

The operating company must make sure that the warning signs, the mandatory signs, and the prohibition signs are possible to be read.

For the recommissioning of the machine, the checklist that follows is to be used:

- The machine is in a damage-free condition.
- The power supply is connected.
- The compressed-air supply is connected.
- The anti-corrosion agent is removed.
- All technology components are clean.
- Tension is applied to all timing belts, flat belts, or V-ribbed belts.
- The main switch is not padlocked.
- The direction of rotation of the motors is examined.
- Necessary operating fluids are filled.

## 6.3 Examining the Safey Circuit

This section has the information about how to examine the safety circuit of the machine.

### 6.3.1 Examining the Emergency Stop Buttons

1. Push one of the emergency stop buttons 1.

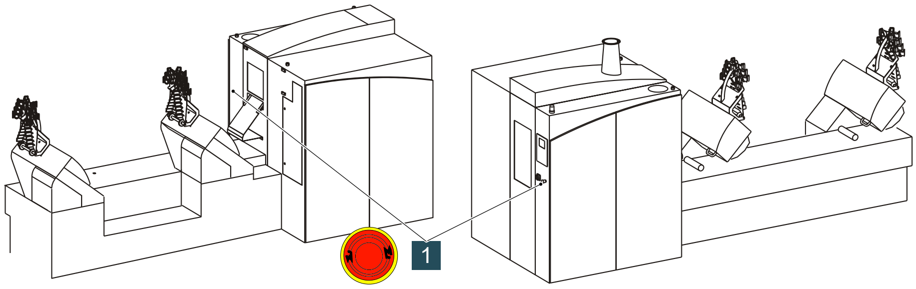


*Figure 50: Emergency stop button*

2. Examine if the fault 220 shows on the operating unit.
3. Examine if the LED indicator of fault is on.
4. Release the emergency stop button 1.
5. Tap the program key [Acknowledge] to remove the fault.
6. Examine if the LED indicator of fault is off.
7. Do the same for the other emergency stop button.

**Result** The emergency stop buttons are examined.

### 6.3.2 Examining the Door Limit Switches

1. Open the door that is monitored by the limit switch S50 2.

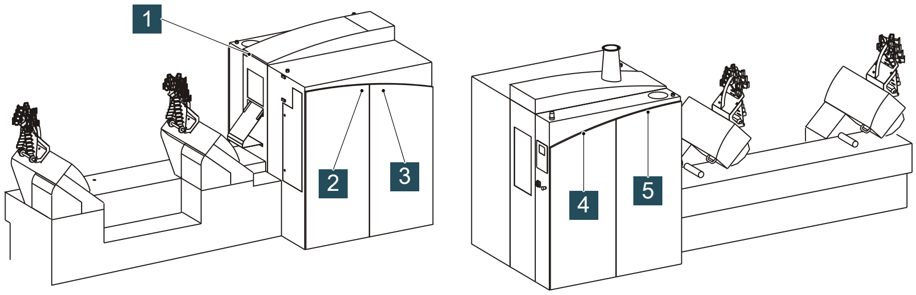


*Figure 51: Door limit switches*

2. Examine if the fault 227 shows on the operating unit.
3. Examine if the LED indicator of fault is on.
4. Close the door.
5. Tap the program key [Acknowledge] to remove the fault.
6. Examine if the LED indicator of fault is off.
7. Do the steps 1 to 6 again to the doors that follow.

**Result** The door limit switches are examined.

| Doors of the Limit Switch | Fault Number |
|---|---|
| S52 1 | Fault 228 |

| Doors of the Limit Switch | Fault Number |
|---|---|
| S51 3 | Fault 227 |
| S55 4 | Fault 229 |
| S54 5 | Fault 229 |

## 6.3.3 Examining the Hood Limit Switches

1. Open the hood that is monitored by the limit switch S61 1.

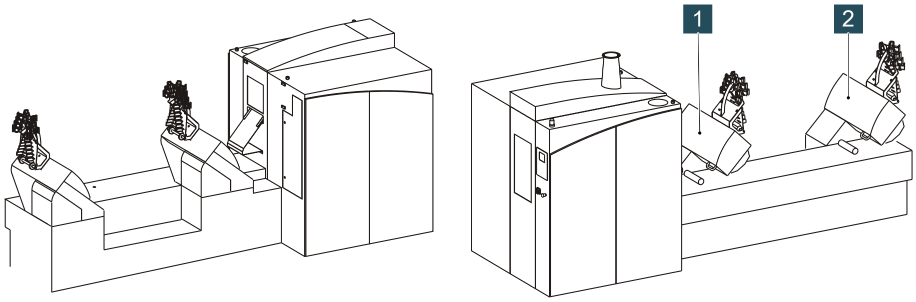


*Figure 52: Hood limit switches*

2. Examine if the fault 230 shows on the operating unit.
3. Examine if the LED indicator of fault is on.
4. Close the hood.
5. Tap the program key [Acknowledge] to remove the fault.
6. Examine if the LED indicator of fault is off.
7. Do the steps 1 to 6 again to the hood that is monitored by the limit switch S62 2.

**Result** The hood limit switches are examined.

## 6.3.4 Examining the Flap Limit Switches

1. Open the flap that is monitored by the limit switch S63 1.

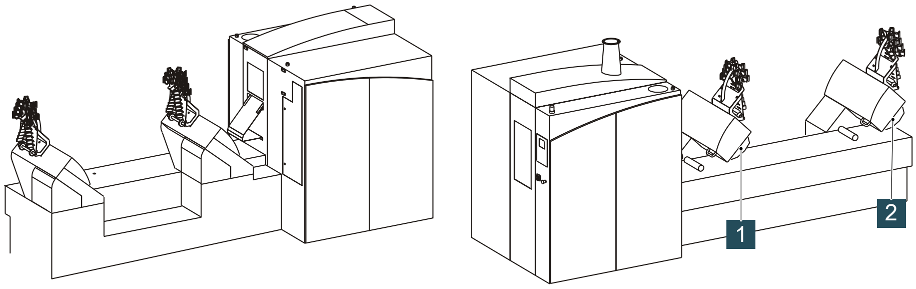


*Figure 53: Flap limit switches*

2. Examine if the fault 231 shows on the operating unit.
3. Examine if the LED indicator of fault is on.

4. Close the door.
5. Tap the program key [Acknowledge] to remove the fault.
6. Examine if the LED indicator of fault is off.
7. Do the steps 1 to 6 again to the flap that is monitored by the limit switch S64 2.

**Result** The flap limit switches are examined.

### 6.3.5 Examining the Drawer Limit Switches

1. Open the drawer that is monitored by the limit switch S65 1.

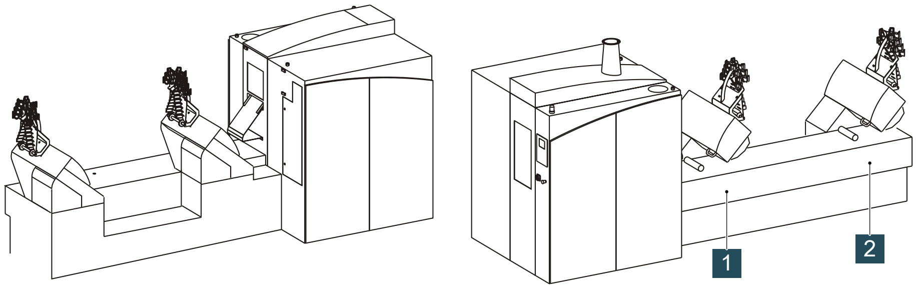


*Figure 54: Drawer limit switches*

2. Examine if the fault 231 shows on the operating unit.
3. Examine if the LED indicator of fault is on.
4. Close the door.
5. Tap the program key [Acknowledge] to remove the fault.
6. Examine if the LED indicator of fault is off.
7. Do the steps 1 to 6 again to the drawer that is monitored by the limit switch S66 2.

**Result** The drawer limit switches are examined.

# 7 Operation

This chapter contains information about:

- The operating personnel
- The name and the location of the display elements and the operating elements
- The operating units
- How to adjust the machine without material and with material
- How to start the machine and the operation procedure
- The operation of the machine during the operation procedure
- How to stop the machine and the operation procedure

## 7.1 Operating Personnel

Only Rieter-approved personnel are permitted to operate the machine.

## 7.2 Display Elements and Operating Elements

The display elements and operating elements of the machine are shown in the figure that follows.

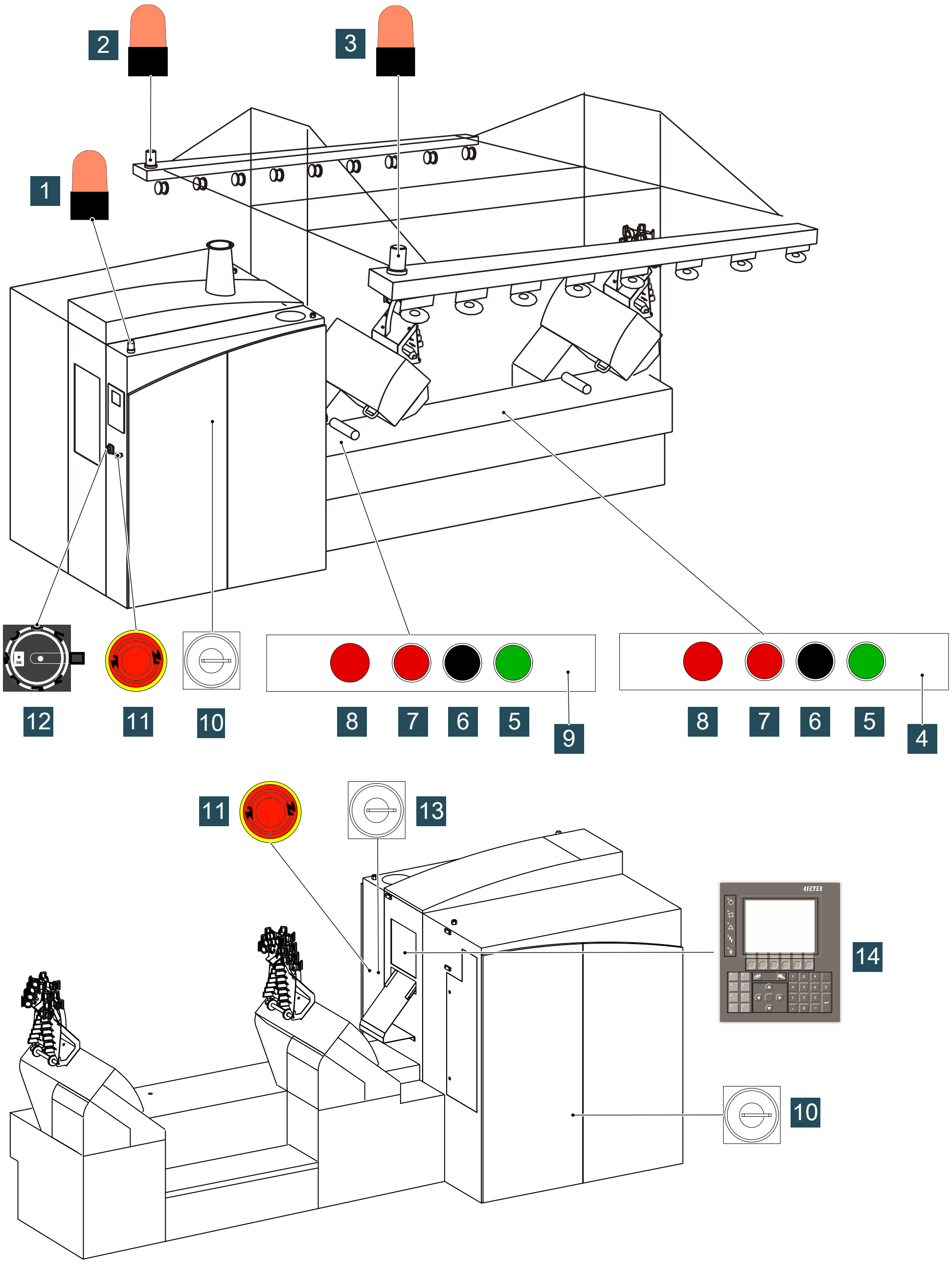


*Figure 55: Display and operating elements*

| | | | |
|---|---|---|---|
| 1 | LED signal lamp of the lap head | 2 | LED signal lamp of the left feed creel |
| 3 | LED signal lamp of the right feed creel | 4 | Rear operator interface panel |
| 5 | Start button | 6 | Jog button |
| 7 | Stop button | 8 | LED signal |
| 9 | Front operator interface panel | 10 | Service switch |

| | | | |
|---|---|---|---|
| 11 | Emergency stop button | 12 | Main switch |
| 13 | Rotary switch | 14 | Operating unit |

## 7.2.1 Display Elements

This chapter contains information about the display elements of the machine.

### 7.2.1.1 LED Signal Lamps

The machine has 3 LED signal lamps. The conditions of each status of the LED signal lamps are shown in the table that follows:

| Status of the LED lamps | LED signal lamp of the lap head | LED signal lamp of the left feed creel | LED signal lamp of the right feed creel |
|---|---|---|---|
| ON | – The machine is at a standstill.<br>– The machine has a fault.<br>– The stop button is pushed.<br>– The machine is in service mode. | – Sliver breaks on the left feed creel. | – Sliver breaks on the right feed creel. |
| OFF | – The main switch is set to the position OFF.<br>– The machine is in operation. | – Sliver is continuous on the left feed creel. | – Sliver is continuous on the right feed creel. |
| Flashing | – The tube is not sufficient for the machine. | -- | -- |

*Table 21:* Conditions of each status of the LED lamps

### 7.2.1.2 LED Indicators of the Operating Unit

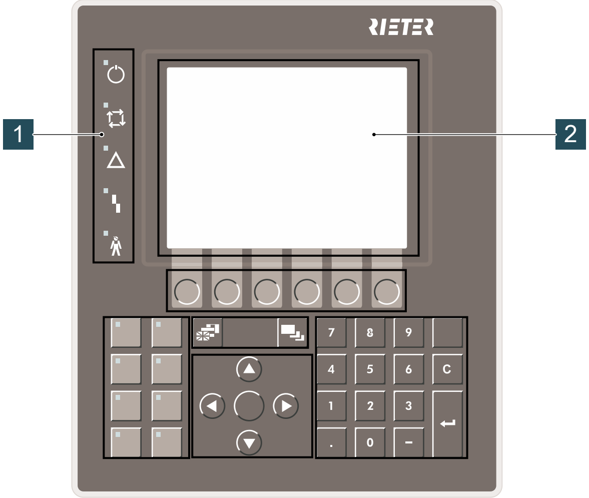


*Figure 56: Display elements at the operating unit*

The operating unit has the display elements that follow:

- LED status indicators 1
- Screen 2

The 5 LED indicators show the status of the machine.

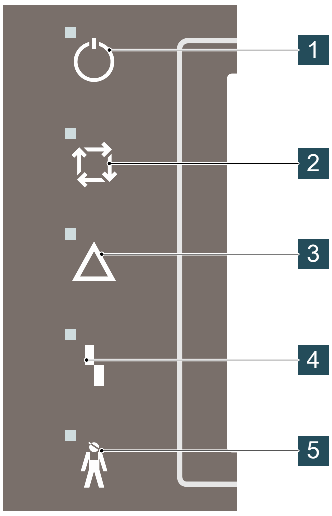
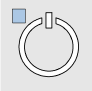


*Figure 57: LED indicators*

| | | | |
|---|---|---|---|
| 1 | LED indicator of power supply | 2 | LED indicator of production mode |
| 3 | LED indicator of warning message | 4 | LED indicator of fault |
| 5 | LED indicator of service mode | | |

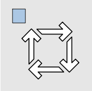
### LED Indicator of Power Supply



The explanations of the status of the LED indicator are as follows:

- The LED indicator flashes when the initial program of the operating unit operates.
- The LED indicator is on when the main switch is set to the position ON.

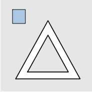
### LED Indicator of Production Mode (Automatic Mode)



The explanations of the status of the LED indicator are as follows:

- The LED indicator flashes when the initial program of the operating unit operates.
- The LED indicator is on when the machine is in the production mode.
- The LED indicator flashes when the user starts or cancels the production mode.

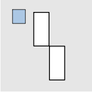
### LED Indicator of Warning Message



The explanations of the status of the LED indicator are as follows:

- The LED indicator flashes when the initial program of the operating unit operates.
- The LED indicator is on when a warning message shows on the screen.

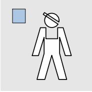
### LED Indicator of Fault



The explanations of the status of the LED indicator are as follows:

- The LED indicator flashes when the initial program of the operating unit operates.
- The LED indicator is on when a fault message shows on the screen.

### LED Indicator of Service Mode



The explanations of the status of the LED indicator are as follows:

- The LED indicator flashes when the initial program of the operating unit operates.
- The LED indicator is on when a fault message or a maintenance warning message on the screen. When these messages show, the service personnel must do the task in the service mode.
- The LED indicator is on when the machine is in the service mode.

## 7.2.2 Operating Elements

This chapter contains information about the operating elements of the machine.

### 7.2.2.1 Main Switch

The main switch has position 0/OFF and position I/ON. The main switch is set to the position 0/OFF to disconnect the power supply from the machine or set to the position I/ON to connect the power supply to the machine. The main switch is not an emergency stop button.

**Locking the Main Switch** Set the main switch to position 0/OFF and padlock it before the maintenance works and the changeover works.

### 7.2.2.2 Start Button

The start button is green.

Before the start button is pushed, the operator must close all hoods and doors.

The start button has 2 functions:

- Machine starting
- Machine starting after clear all error messages.

### 7.2.2.3 Stop Button

The stop button is red.

When the operator pushes the stop button, the machine stops and the drafting system automatically releases load after a specified period of time. But the scanning rollers do not release load.

### 7.2.2.4 Emergency Stop Button

The emergency stop button is only used if there is an emergency. When the operator pushes the emergency stop button, the situations that follow occur:

- The machine stops immediately.
- All connected peripheral machines of the machine stop immediately.

The operator can turn the emergency stop button to release the emergency stop button.

### 7.2.2.5 Jog Button

The jog button is black.

If the operator pushes and holds the jog button, the machine starts to work with slow speed.

If the operator pushes the jog button and releases the jog button suddenly, the load applies to the calender rollers in the lap head and the top rollers in the drafting systems. The machine does not work and the load releases after 10 seconds.

### 7.2.2.6 Rotary Switch

The rotary switch has the functions that follow:

- If the operator turns the rotary switch to the right position, the infeed door opens.
- If the operator turns the rotary switch back to the initial position, the infeed door closes.

### 7.2.2.7 Service Switch

The service switch is used to start the service function. When the service function is selected on the screen, the operator can turn the service switch to start the service function when the doors are open.

### 7.2.2.8 Keys at the Operating Unit

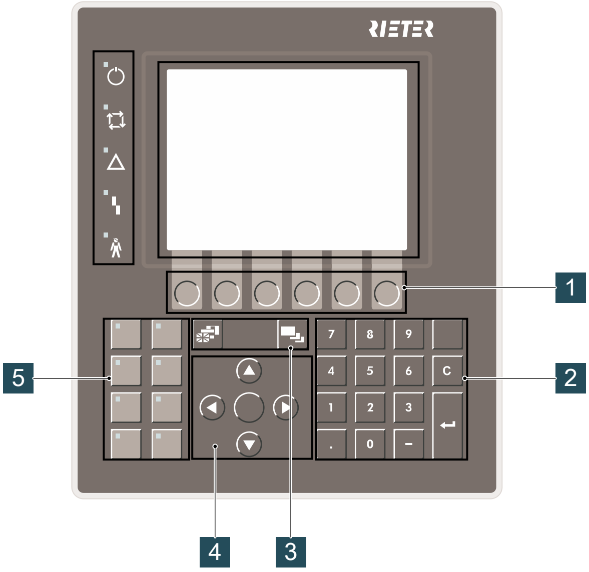


*Figure 58: Keys at the operating unit*

The operating unit has the keys that follow:

- Program keys 1
- Numeric keys 2
- Selection keys 3
- Arrow keys 4
- Machine keys 5

### Program Keys

The program keys have different function with different menu or data screen. The keys shown on the screen above the program keys give the functions of the program keys.

### Numeric Keys

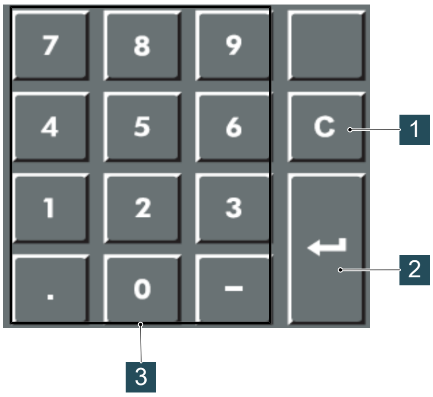


*Figure 59: Numeric keys*

| Item | Name | Explanation |
|---|---|---|
| 1 | [Delete] | The key is used to delete the entered values. |
| 2 | [Enter] | The key is used to accept the entered value. |
| 3 | Numeric keypad | The keys at the numeric keypad are used to enter the numerical values onto the data screen. |

### Selection Keys

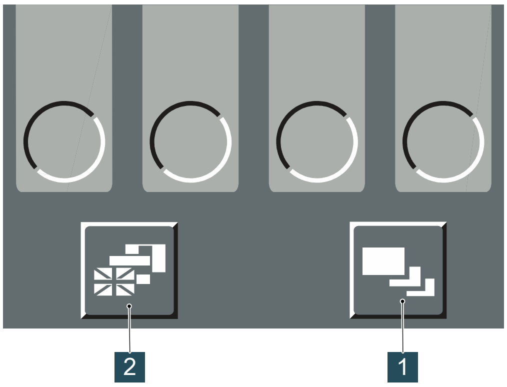


*Figure 60: Selection keys*

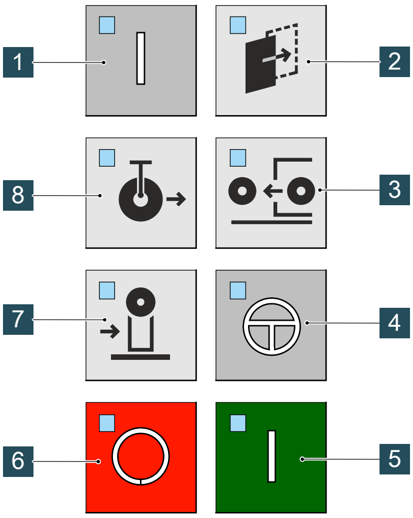
| Item | Name | Explanation |
|---|---|---|
| 1 | [Main Screen] | The key is used to show the standard overview screen or the fault screen. |

| Item | Name | Explanation |
|---|---|---|
| 2 | [Language Selection] | The key is used to change the language of the screen. |

## Arrow Keys

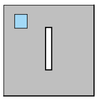
The arrow keys are used to move the cursor to the arrow direction.

## Machine Keys



| | | | |
|---|---|---|---|
| 1 | Run key | 2 | Key of opening front door |
| 3 | Key of ejecting lap | 4 | Jog key |
| 5 | Start key | 6 | Stop key |
| 7 | Key of releasing lock for lap trolley | 8 | Key of moving lap |

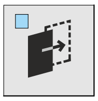
## Run Key



The key is used to start the last selected function.

The LED status indicator at the key flashes when the function works.

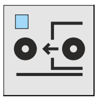
## Key of Opening Front Door



The key is used to open the front door. The function of the key starts after tapping the run key.

The LED status indicator at the key is on when the function works.

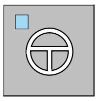
### Key of Ejecting Lap



The key is used to eject the lap. The function of the key starts after tapping the run key.

The LED status indicator at the key is on when the function works.

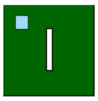
### Jog Key



The key is used to make the machine work with slow speed. The machine stops if the operator releases the key.

The LED status indicator at the key is on when the function works.

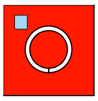
### Start Key



The key is used to start the machine.

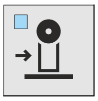
An error message shows on the screen if the machine does not start after tapping the key.

### Stop Key



The key is used to stop the machine.

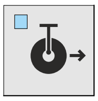
### Key of Releasing Lock for Lap Trolley



The key is used to release the lock for the lap trolley. The function of the key starts after tapping the run key.

The LED status indicator at the key is on when the function works.

### Key of Moving Lap



The key is used to move the lap with the transport system. The function of the key starts after tapping the run key.

The LED status indicator at the key is on when the function works.

## 7.3 Gearing Layout and Technical Tables

This section contains the information about the gearing layout and the technical tables.

### 7.3.1 Gearing Layout

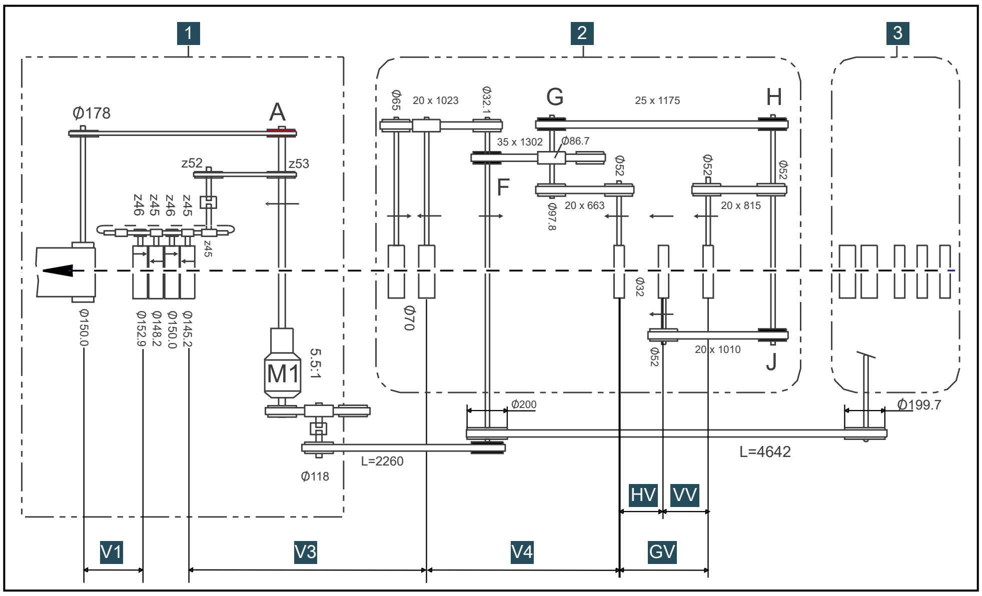

1
2
3
Ø178
A
z52
z53
z46
z45
z46
z45
z45
Ø150.0
Ø152.9
Ø148.2
Ø150.0
Ø145.2
M1
5.5:1
Ø118
L=2260
Ø65
20 x 1023
Ø32.1
G
25 x 1175
H
35 x 1302
Ø86.7
F
Ø52
Ø52
Ø52
20 x 663
Ø97.8
20 x 815
Ø70
Ø32
Ø52
20 x 1010
J
Ø200
Ø199.7
L=4642
HV
VV
V1
V3
V4
GV

*Figure 61: Gearing layout*

| | | | |
|---|---|---|---|
| 1 | Lap head | 2 | Front of drafting system |
| 3 | Rear of drafting system | V1 | Winding tension, calender to wind-up |
| V3 | Tension upline of lap head | V4 | Output draft beyond drafting system |
| HV | Main draft of drafting system(determined by GV and VV) | GV | Total draft of drafting system |
| VV | Break draft of drafting system | | |

### 7.3.2 Tables of Locations for Changes

This section contains the information about tables of locations for changes.

#### Total Draft of Drafting System

| GV(fold) | Belt Pulley at Position G | Belt Pulley at Position H |
|---|---|---|
| 1.395 | 89.85 | 67.5 |
| 1.429 | 89.85 | 69.2 |
| 1.455 | 88.15 | 69.2 |
| 1.491 | 88.15 | 70.95 |
| 1.520 | 86.4 | 70.95 |
| 1.555 | 86.4 | 72.65 |
| 1.586(*) | 84.7 | 72.65 |

| GV(fold) | Belt Pulley at Position G | Belt Pulley at Position H |
|---|---|---|
| 1.622 | 84.7 | 74.35 |
| 1.655 | 82.95 | 74.35 |
| 1.692 | 82.95 | 76.1 |
| 1.727 | 81.25 | 76.1 |
| 1.764 | 81.25 | 77.8 |
| 1.801 | 79.55 | 77.8 |
| 1.840 | 79.55 | 79.55 |
| 1.880 | 77.8 | 79.55 |
| 1.919 | 77.8 | 81.25 |
| 1.961 | 76.1 | 81.25 |
| 2.000 | 76.1 | 82.95 |
| 2.046 | 74.35 | 82.95 |
| 2.088 | 74.35 | 84.7 |
| 2.135 | 72.65 | 84.7 |
| 2.177 | 72.65 | 86.4 |
| 2.227 | 70.95 | 86.4 |
| 2.271 | 70.95 | 88.15 |
| 2.326 | 69.2 | 88.15 |
| 2.370 | 69.2 | 89.85 |
| 2.427 | 67.5 | 89.85 |
| (*)Standard value | | |

*Table 22:* Total draft of drafting system

## Break Draft of Drafting System

| VV(fold) | Belt Pulley at Position J |
|---|---|
| 1.032 | 53.7 |
| 1.062(*) | 55.3 |
| 1.112 | 58 |
| (*)Standard value | |

*Table 23:* Break draft of drafting system

## Winding Tension, Calender to Wind-up

| Winding Tension (V1) (%) | Belt Pulley, Change A |
|---|---|
| 1.00 | 178.5 |
| 2.00 | 180.3 |

| Winding Tension (V1) (%) | Belt Pulley, Change A |
|---|---|
| 3.00 | 182.1 |
| 4.00(*) | 183.9 |
| 5.00 | 185.7 |
| (*)Standard value | |

*Table 24:* Winding tension, calender to wind-up

### Tension up Line of Lap Head

| Tension (V3) (%) | E Change |
|---|---|
| -0.6 | 157.5 |
| 0.3(*) | 159.0 |
| 1.3 | 160.5 |
| (*)Standard value | |

*Table 25:* Tension up line of lap head

### Output Draft beyond Drafting System

| Output Draft (V4) (%) | Change Gear F |
|---|---|
| -1.00 | 52.5 |
| 0.05(*) | 52.0 |
| 1.10 | 51.5 |
| 2.15 | 51.0 |
| (*)Standard value | |

*Table 26:* Output draft beyond drafting system

## 7.3.3 Technical Tables for Material Related Settings

This section contains the information about the technical tables for material related settings.

### Batt Weight Related to Fiber Count

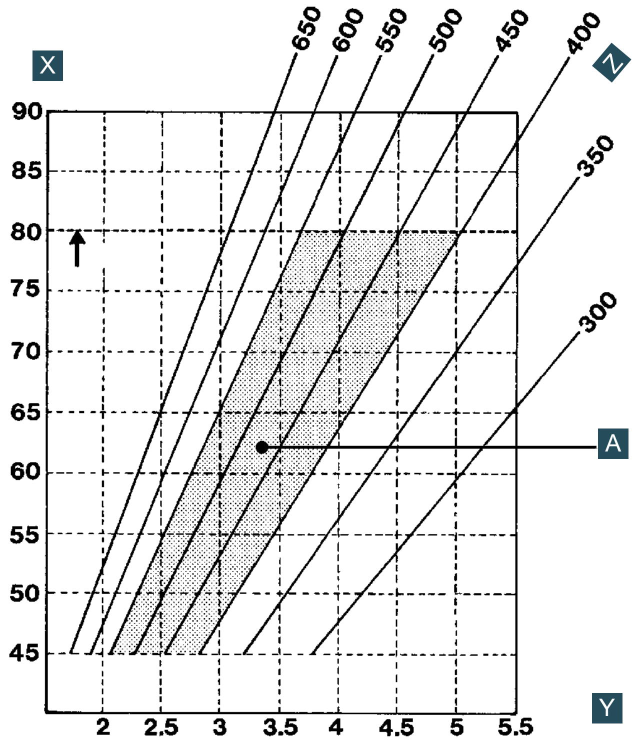


*Figure 62: Batt weight relates to fiber count*

| | | | |
|---|---|---|---|
| A | Working range | X | Batt weight per unit length (in g/m) |
| Y | Micronaire fineness of fiber | Z | Number of fibers in thousands |

### Number of Fibers in the Batt Cross-section

| Description | Specification |
|---|---|
| The number of fibers has to be within working range A | A maximum of 550,000 fibers in the cross-section and a maximum batt weight of 80 g/m. |
| The number of fibers has to be in the upper range. | The yarn quality relates to a higher batt weight. |

*Table 27:* Number of fibers in the batt cross-section

### Total Draft of Combing Preparation

| Description | Specification |
|---|---|
| Short, medium staple | 7 – 8.5 |
| Long staple | 8.5 - 10 |

*Table 28:* Total draft of combing preparation

## Total Draft of Combing Preparation Machine

| Description | Specification |
|---|---|
| Drafting zone | Max. 7-10 fold |
| If the card machine is installed with a drafting system | The draft of the card machine has to be included in the total draft calculation. |
| The lower the total draft in the combing preparation is | The less hairy the lap will be. |

*Table 29:* Total draft of combing preparation machine

## First Draw Frame Doubling

| Fiber Length | Doubling, Preparatory Drawing Frame<br>(fold) |
|---|---|
| Short, medium staple | Max. 5 |
| Long staple | Max. 6 |

*Table 30:* First draw frame doubling

## Doubling, Preparatory Drawing Frame

| Description | Specification |
|---|---|
| Working range | Max. 5 -6 fold |
| The lower the doubling is | The higher the batt cohesion will be. |

*Table 31:* Doubling, Preparatory Drawing Frame

## Output Sliver Weight of First Draw Frame

| Number of Slivers at OMEGAlap | Sliver Weight at Outlet of Preparatory Draw Frame (g/m) |
|---|---|
| 28 (long staple) | 3.7 - 4 |
| 26 - 28 (medium-length / long staple) | 4 – 4.5 |
| 24 - 26 (short / medium-length staple) | 4.5 - 6 |

*Table 32:* Output sliver weight of first draw frame

## Sliver Weight at Outlet of Preparatory Drawing Frame

| Description | Specification |
|---|---|
| Working range | 3.7 – 6 g/m |

*Table 33:* Sliver weight at outlet of preparatory drawing frame

## Total Draft

| Fiber Length | GV (fold) |
|---|---|
| Short, medium staple | 1.4 – 1.7 |
| Long staple | 1.7 – 2.0 |

*Table 34:* Total draft

## Table of Break Draft Distance

| Commercial Staple | Nipping Line Distance | Gauge Dimension (VVD) |
|---|---|---|
| Cotton (1")<br>25.4 mm | 45(*) | 1 |
| Cotton (1 1/8")<br>28.5 mm | 48(*) | 4 |
| Cotton (1 3/16")<br>30.1 mm | 49(*) | 5 |
| Cotton (1 1/4")<br>31.75 mm | 50(*) | 6 |
| Cotton (1-7/16")<br>36.5 mm | 51(*) | 7 |
| (*) nominal value | | |

*Table 35:* Table of break draft distance

## Break Draft Distance

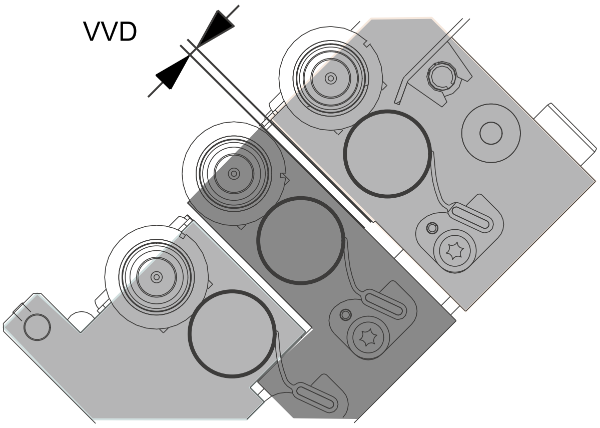


*Figure 63: Break draft distance*

| Fiber length | Total draft of combing preparation machine (fold) |
|---|---|
| Setting range | 44 – 63 mm |
| VVD | Nipping line distance (mm) minus 44 mm |
| Break draft distance | 2 to 4 mm more than main draft distance |

*Table 36:* Break draft distance

## Table of Main Draft Distance

| Commercial staple | Nipping line distance | Gauge dimension (HVD) |
|---|---|---|
| Cotton (1")<br>25.4 mm | 42(*) | 0 |
| Cotton (1 1/8")<br>28.5 mm | 45(*) | 3 |
| Cotton (1 3/16")<br>30.1 mm | 46(*) | 4 |
| Cotton (1 1/4")<br>31.75 mm | 47(*) | 5 |
| Cotton (1 7/16")<br>36.5 mm | 48(*) | 6 |
| (*) Standard value | | |

*Table 37:* Table of main draft distance

## Main Draft Distance

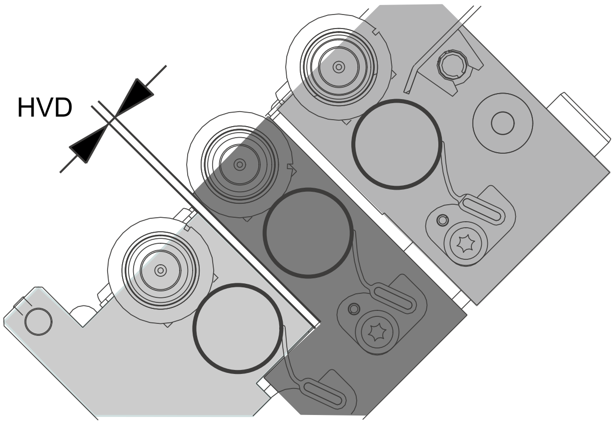


*Figure 64: Main draft distance*

| Description | Value |
|---|---|
| Setting distance | 42 – 60 mm |
| HVD | Nipping line distance (mm) minus 42 mm |

*Table 38:* Main draft distance

### Material-related Winding Tension V1

The optimal setting must be determined by trial and error. Too small tension causes hairy laps. Too much tension causes drifts.

| Fiber Length | Winding Tension V1 (%) |
|---|---|
| Short, medium staple | 4(*) |
| Long staple | 3(*) |
| (*) nominal value | |

*Table 39:* Material-related winding tension V1

### Material-related Winding Tension V3

The optimal setting must be determined by trial and error. Too small tension causes an ‘unsatisfactory running characteristics’. Too much tension causes incorrect drafts.

| Fiber Length | Tension V3 (%) |
|---|---|
| Short, medium staple | 0.3(*0 |
| Long staple | -0.6(*0 |
| (*) nominal value | |

*Table 40:* Material-related winding tension V3

## 7.4 Machine Operating Unit

The section contains information about the program keys on the operating unit and the information about the data screen.

### 7.4.1 Introduction of the Program Keys

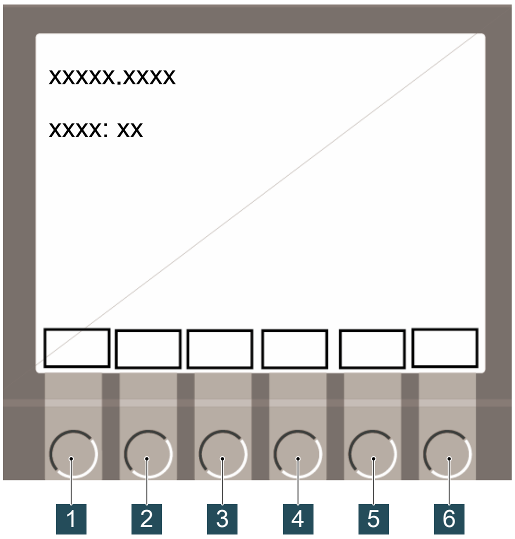


*Figure 65: Program keys*

The machine has 6 program keys. Each program key relates to different function icons. Push 1 of the program keys to select the shown function at the bottom of the data screen.

| Program Keys | Function icons | Key Name |
|---|---|---|
| 1 | 30.2 | [Direct Next] |
| | ∧ | [Cursor Back] |
| | ✓ | [Acknowledge] |
| 2 | 40.1 | [Direct Back] |
| | ∨ | [Cursor Forward] |
| | ? | [Help] |
| 3 | » | [Menu Overview] |
| | ⌅ | [Top of the List] |
| | +/− | [Plus / Minus] |
| | - | [Minus] |
| | - ↵ | [Minus Enter] |

| Program Keys | Function icons | Key Name |
|---|---|---|
| | ☼- | [Darker Display] |
| 4 | ○─□ | [Enter Password] |
| | ○/─□ | [Cancel Password] |
| | ⊻ | [End of the List] |
| | **0....9** | [Number Keys] |
| | + | [Plus] |
| | +↵ | [Plus Enter] |
| | ☼+ | [Brighter Display] |
| 5 | < | [Previous Screen] |
| | C | [Cancel] |
| 6 | > | [Next Screen] |
| | ↵ | [Enter] |

*Table 41:* Program keys

### 7.4.2 Access Concept

The users have the access rights as follows.

| Level | Default Password | Description |
|---|---|---|
| Level 1 | No password is necessary. | Read<br>The user has access to all data screens and functions that are without password protection. |
| Level 2 | 1001 | Edit<br>The user is permitted to do all adjustments and has access to all functions for production. |

| Level | Default Password | Description |
|---|---|---|
| Level 3 | 1002 | More entries<br>The user is permitted to do more adjustments for the machine. |
| Level 4 | 1432 (master password) | The user is permitted to change the password for different levels |

*Table 42:* Authorization levels

If the master password is forgotten, please contact the Rieter service department for a special password that is valid for 1 day.

### Changing the Password

If the user logged in with level 2 or level 3, the user is permitted to change the password of level 2 and level 3. If the user logged in with level 4, the user is permitted to change the password for level 2, level 3, and level 4.

1. Tap the program key [Main Screen] to go to the main screen.
2. Tap the program key [Enter Password] to enter the master password.
3. Tap the program key [Next Screen] to open the data screen to change the password.
4. Enter a new password.
5. Enter the new password again.
   ⇨ The password of current access level is changed.
6. If it is necessary to change the password of next level, tap the program key [Next Screen] to go to the next password level to change the password.

**Result** The password is changed.

### Canceling Password Authorization

The password authorization is automatically canceled if no button is pushed in 10 minutes. (In test mode, the password authorization is automatically canceled in 10 hours). The logged in user also is permitted to manually cancel the password authorization to prevent an unauthorized person to change the adjustments.

1. Tap the program key [Main Screen] to go to main screen.
2. Tap the program key [Cancel Password] 1 to cancel password authorization.

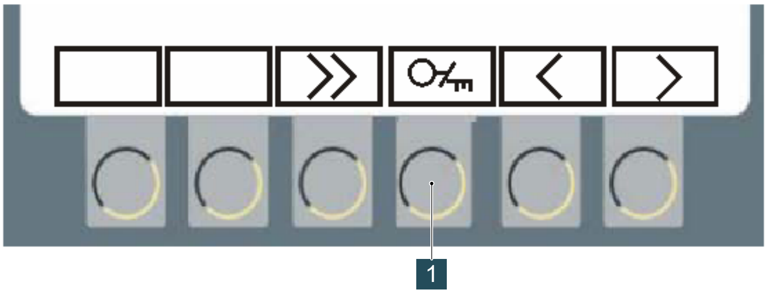


*Figure 66: Cancel password button*

**Result** The password authorization is canceled.

### 7.4.3 Structure of the Data Screen

| No. | Menus and Data Screens | Authorization Level |
|---|---|---|
| 10 | **10 Actual values, production** | -- |
| 10.1 | **Actual values machine** | Level 2 and above |
| 11 | **11 Actual values, shift data** | -- |
| 11.1 | **Current shift** | -- |
| 11.2 | **Overview of shifts** | -- |
| 11.3 | **Sum counter** | Level 2 and above |
| 12 | **12 Set values production** | -- |
| 12.1 | **Set values** | -- |
| 12.1 | **Set values** | -- |
| 12.2 | **Contact-pressure curve** | -- |
| 30 | **30 Information general** | -- |
| 30.1 | **General** | -- |
| 30.3 | **Input overview** | -- |
| 30.4 | **Output overview** | -- |
| 30.5 | **Analog input overview** | -- |
| 30.6 | **Overview analog output** | -- |
| 31 | **31 Information protocols/statistics** | -- |
| 31.1 | **Current warnings** | -- |
| 31.2 | **Current maintenance warnings** | -- |
| 31.3 | **Current errors** | -- |
| 31.4 | **Events occurred** | -- |
| 31.5 | **Events stats, machine** | -- |
| 31.6 | **Events stats, shifts** | -- |
| 31.7 | **Protocols / clear stats** | -- |

| No. | Menus and Data Screens | Authorization Level |
|---|---|---|
| 40 | **40 Setup values general** | -- |
| 40.1 | **Date/times** | Level 2 and above |
| 40.2 | **Units / overview** | Level 2 and above |
| 40.3 | **Languages** | Level 2 and above |
| 41 | **41 Setup values machine** | -- |
| 41.1 | **Machine general** | -- |
| 41.2 | **Machine data** | -- |
| 42 | **42 Setup belt adjustment** | -- |
| 42.1 | **Belt Control Setup** | Level 2 and above |
| 43 | **43 Belt adjustmnt. paramtr./act. values** | -- |
| 43.1 | **Belt control parameter** | Level 2 and above |
| 43.2 | **Belt control act. values** | -- |
| 43.3 | **Belt control diagram** | -- |
| 50 | **50 Shift plan** | -- |
| 50.1 | **General** | -- |
| 50.2 | **Shift schedule** | -- |
| 80 | **80 Change service modes** | -- |
| 80.1 | **Switch service mode** | Level 2 and above |
| 81 | **81 Test inputs/outputs** | -- |
| 81.1 | **Input test** | Level 2 and above |
| 81.2 | **Output test** | Level 2 and above |
| 82 | **82 Service functions** | -- |
| 82.1 | **Service functions** | Level 2 and above |
| 83 | **83 System functions** | -- |
| 83.1 | **System start** | Level 2 and above |
| 84 | **84 System test** | -- |
| 84.1 | **Test keys and LED** | Level 2 and above |

### 7.4.4 Main Screen

The main screen shows the actual production data of the machine.

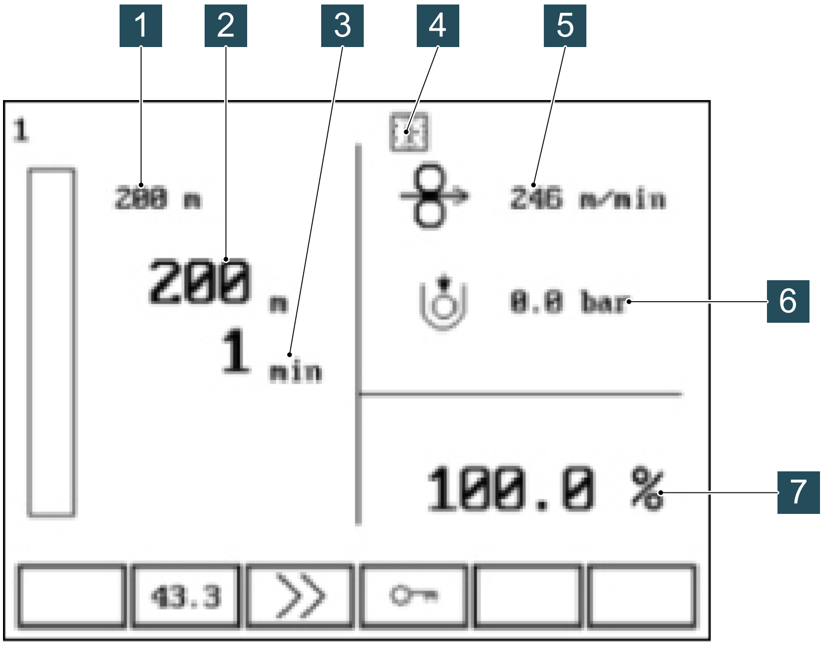

1
2
3
4
5
6
7
1
200 m
200 m
1 min
246 m/min
0.0 bar
100.0 %
43.3

*Figure 67: Main screen*

| | | | |
|---|---|---|---|
| 1 | Lap length | 2 | Lap length before the lap change |
| 3 | Remaining time until the lap change | 4 | Current shift |
| 5 | Winding speed | 6 | Applied clamping pressure to the lap belt |
| 7 | Machine efficiency | | |

### 7.4.5 Data Screen of Messages

Faults or warning messages shown on the data screen as follows:

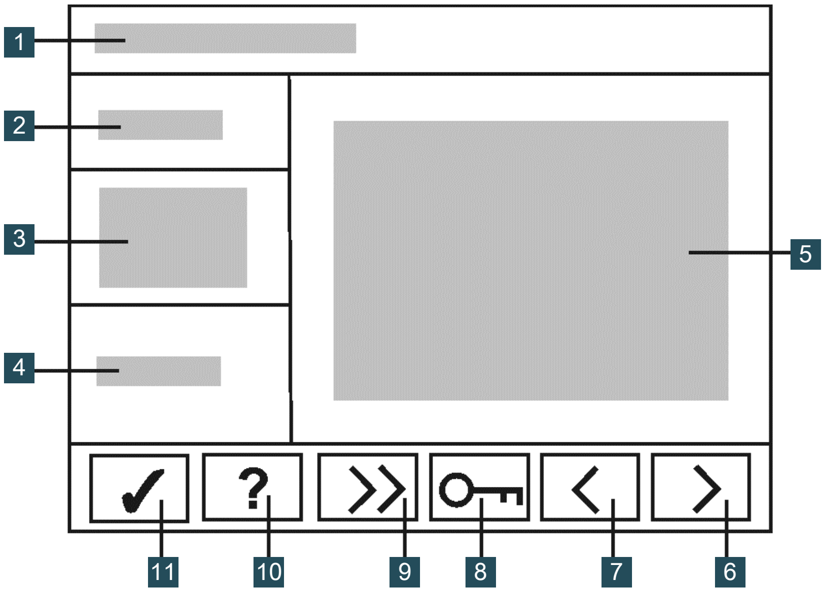


*Figure 68: Data screen of messages*

| | | | |
|---|---|---|---|
| 1 | Type of the message | 2 | The code of the message |
| 3 | The general location of the fault at the machine | 4 | Numbers of the messages |
| 5 | The accurate location of the problem at the machine | 6 | Key [Next Screen] |
| 7 | Key [Previous Screen] | 8 | Key [Enter Password] |
| 9 | Key [Menu] | 10 | Key [Help] |
| 11 | Key [Acknowledge] | | |

## Removing the Faults or Warning Messages

When the faults or warning messages are shown in the main data screen, the operator needs to find the solution to the fault first.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The fault is removed.

✓ The key [Acknowledge] shows in the main data screen.

1. Tap the program key [Acknowledge] 11 to remove the faults or warning messages from the main data screen.
2. If there are more than 1 faults at the machine, examine all faults in the field of 4.

   ⇨ Make sure that all faults are removed from the machine.
3. Tap the program key [Start] to start the machine.

**Result** The faults or warning messages are removed from the main data screen.

### Showing More Help Text for Troubleshooting

For some faults, the more help text shows more information about the fault at the machine.

**Prerequisites** Make sure that the criteria are obeyed:

✓ A fault occurs at the machine.

1. Tap the program key [Help] 10 to show the more help text.
2. Tap the program key [Previous Screen] 7 to show the message again.

**Result** The more help text is shown.

## 7.4.6 Setting the Standard Overview Screen

If there are more than1 overviews, 1 of the overviews can be selected as the standard overview screen.

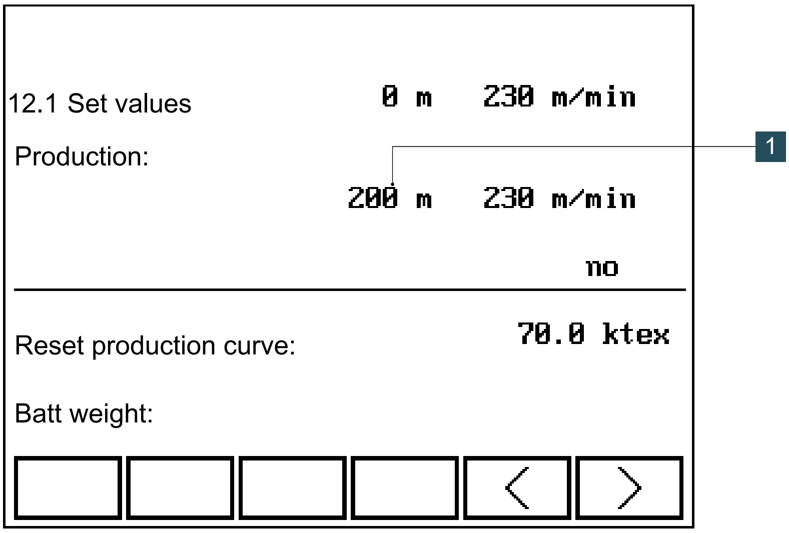
1. Tap the program key [Enter Password] to enter the password.
2. Open the data screen 40.2.
3. In the field of **Standard overview:** , tap the program key [Minus] or [Plus] to select the number of the overview screen.
4. Tap the program key [Enter] to apply the selection.

**Result** The standard overview screen is set.

## 7.4.7 Changing the Lap Length

This section contains the information about how to change the lap length.

### Without the VARIOspeed



12.1 Set values

0 m 230 m/min

Production:

200 m 230 m/min

no

Reset production curve:

70.0 ktex

Batt weight:

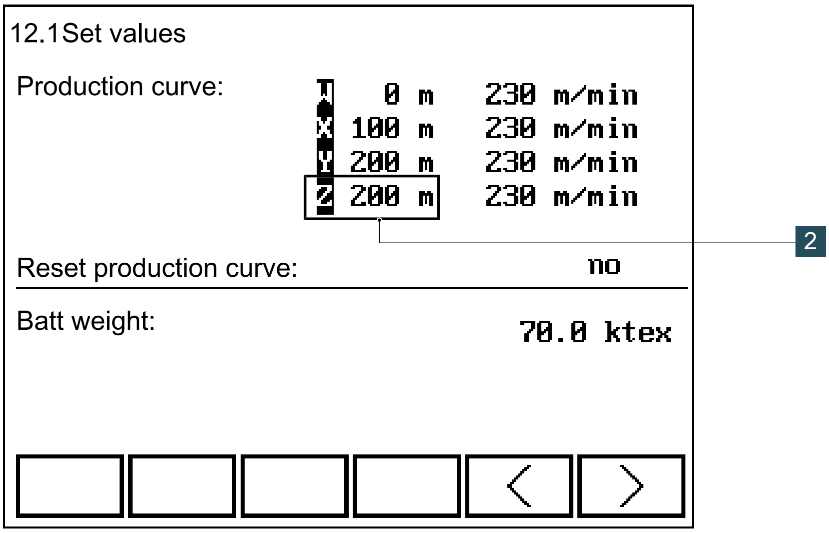
*Figure 69: Data screen 12.1 Set values (without VARIOspeed)*

1. Tap the program key [Enter Password] to enter the password.

2. Tap the program key [Cursor Back] or [Cursor Forward] to select the value of the lap length 1.
3. Tap the program key [Minus] or [Plus] to change the value of the lap length 1.
4. Tap the program key [Enter] to apply the setting.

**Result** The lap length is changed.

## With the VARIOspeed



12.1Set values

Production curve:
W 0 m 230 m/min
X 100 m 230 m/min
Y 200 m 230 m/min
Z 200 m 230 m/min

Reset production curve: no

Batt weight: 70.0 ktex

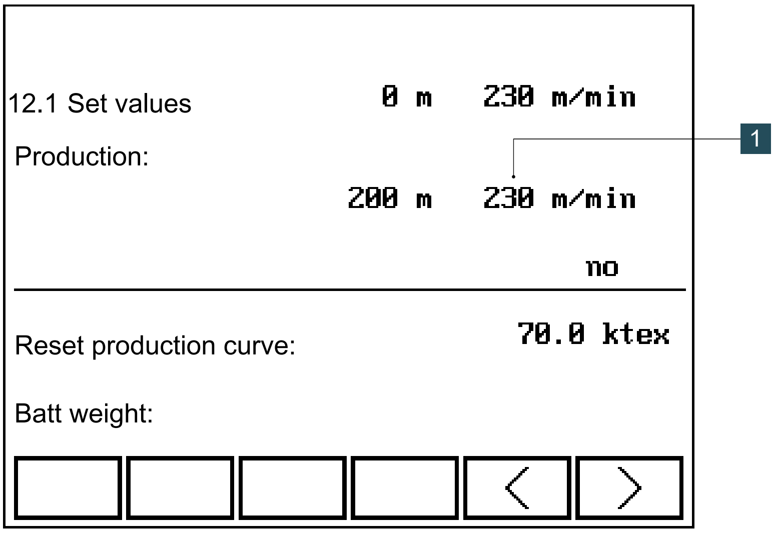
*Figure 70: Data screen 12.1 Set values (with VARIOspeed)*

1. Tap the program key [Enter Password] to enter the password.
2. Tap the program key [Cursor Back] or [Cursor Forward] to select the value of the lap length 2.
3. Tap the program key [Minus] or [Plus] to change the value of the lap length 2.
4. Tap the program key [Enter] to apply the setting.

**Result** The lap length is changed.

### 7.4.8 Changing the Production Speed

#### Without the VARIOspeed


12.1 Set values

Production: 0 m 230 m/min

200 m 230 m/min

Reset production curve: no

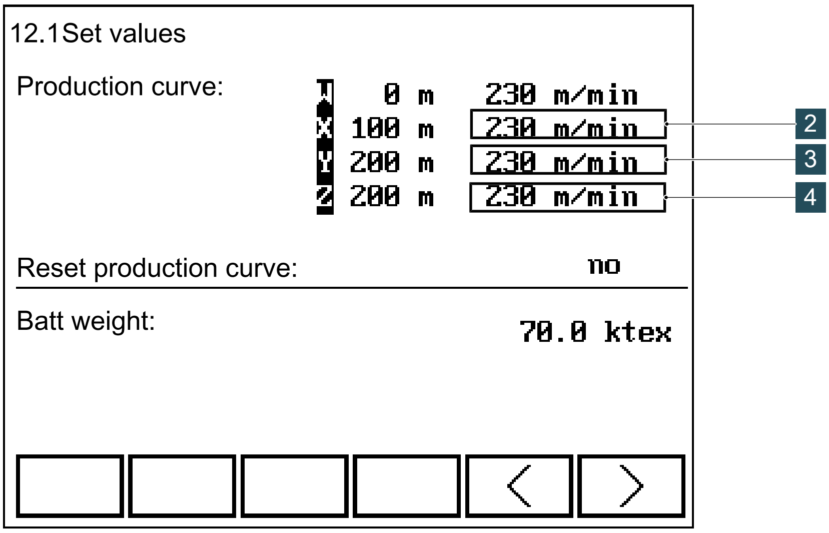
Batt weight: 70.0 ktex

*Figure 71: Data screen 12.1 Set values (without VARIOspeed)*

1. Tap the program key [Enter Password] to enter the password.
2. Tap the program key [Cursor Back] or [Cursor Forward] to select the production speed 1.
3. Tap the program key [Minus] or [Plus] to change the production speed 1.
4. Tap the program key [Enter] to apply the setting.

**Result** The production speed is changed.

#### With the VARIOspeed


12.1Set values

Production curve:

W 0 m 230 m/min
X 100 m 230 m/min
Y 200 m 230 m/min
Z 200 m 230 m/min

Reset production curve: no

Batt weight: 70.0 ktex

*Figure 72: Data screen 12.1 Set values (with VARIOspeed)*

1. Tap the program key [Enter Password] to enter the password.
2. Tap the program key [Cursor Back] or [Cursor Forward] to select the production speed 2.
3. Tap the program key [Minus] or [Plus] to change the production speed 2.
4. Change the production speed 3 and 4 the same as changing the production speed 2.
5. Tap the program key [Enter] to apply the setting.

**Result** The production speeds are changed.

### 7.4.9 Doing the Function Test

**WARNING**

**Moving parts!**

Dangerous injuries because of the moving parts when you do the function test.

- Do **NOT** stay near the moving parts.
- Only the approved personnel are permitted to do the function test in the service mode.

1. Close all doors and all covers that have an installed safety circuit.
2. Tap the program key [Enter Password] to enter the password of level 2 in the main screen.
3. Select the **Service mode** in the data screen 80.1.
4. Select the test data screen (82.1 to 8n.n) that is necessary to do the function test.
5. Select the unit that is necessary to be examined.
6. Select the movement type.
7. **WARNING! Moving parts! Dangerous injuries because of the mechanical movements of the parts when you do the function test.** Tap the program key [Enter] to apply the selection.
8. Tap the key [Start] to start the movement.
   - ⇨ The test function is started.
   - ⇨ The statues of the sensors are shown in the field **Information:** .
9. Release the button [Start] to stop the movement for most functions.
10. Tap the key [Stop] to stop the movement for other functions.

**Result** The function test is done.

## Doing the Function Test of the Lap Head

When the doors of the lap head are open, the service switch is turned to do the function test.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The test function is selected in the related data screen.

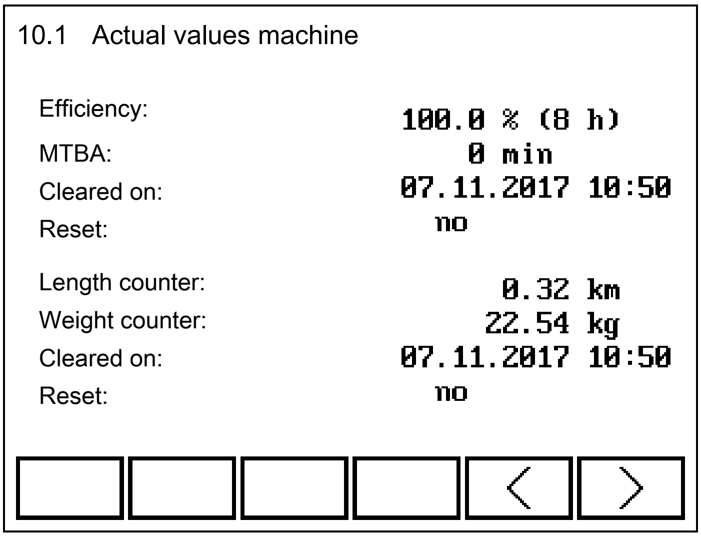
1. Open the door of the lap head on the side selected for observation.
2. Turn the service switch to start the movement.

**Result** The test function is started.

## 7.4.10 Menu 10

The menu **10 Actual values, production** has the following data screens:

### 7.4.10.1 Data Screen 10.1



10.1 Actual values machine

Efficiency: 100.0 % (8 h)
MTBA: 0 min
Cleared on: 07.11.2017 10:50
Reset: no

Length counter: 0.32 km
Weight counter: 22.54 kg
Cleared on: 07.11.2017 10:50
Reset: no

*Figure 73: Data screen 10.1 Actual values machine*

The data screen 10.1 **Actual values machine** shows the actual values of the machine.

**Efficiency:** This value shows the machine efficiency of the last 2, 4, or 8 hours. The time interval to calculate the machine efficiency can be adjusted in the data screen 40.1.

**MTBA:** The **MTBA:** is the mean time between assists. The value shows the average time of the machine in production before the machine is stopped because of a fault.

**Cleared on:** The value is the last date and the time when the production value was deleted.

**Reset:** To reset the production values, the user pushes the button [Plus] to select yes, and push the [Enter] to apply the selected value.

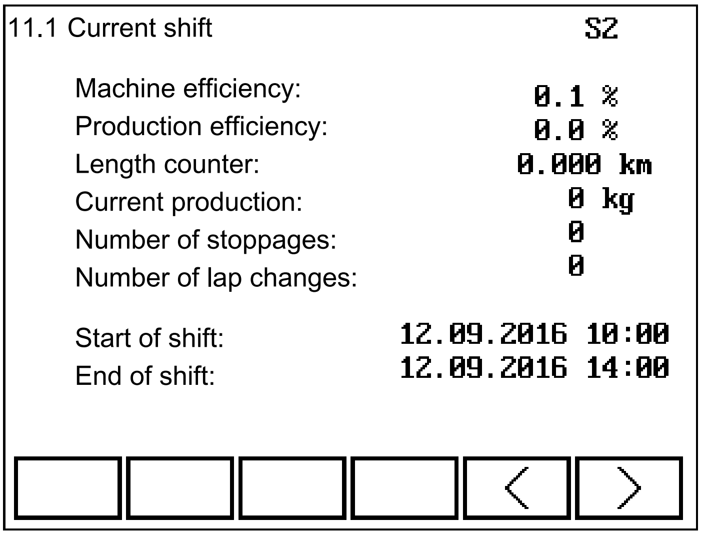
**Length counter:** The value shows the length of the produced lap in kilometer.

**Weight counter:** The value shows the total weight of the produced lap in kilogram.

### 7.4.11 Menu 11

The menu **11 Actual values, shift data** has data screens that show the actual production data of each shift.

#### 7.4.11.1 Data Screen 11.1



11.1 Current shift S2

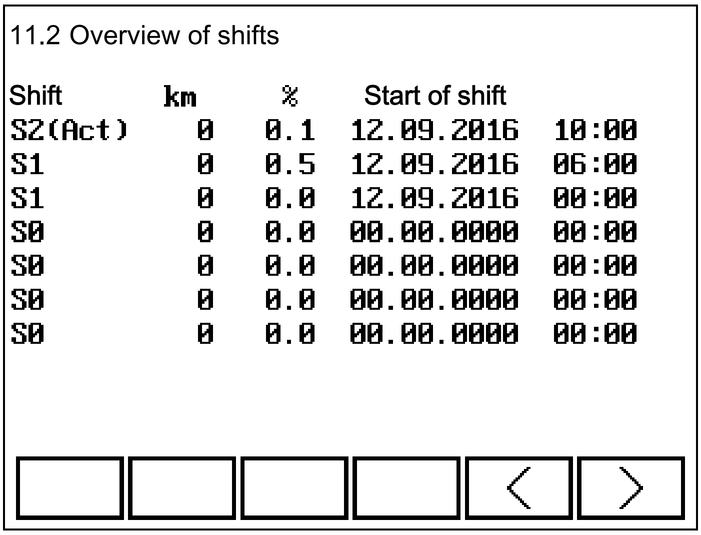
Machine efficiency: 0.1 %
Production efficiency: 0.0 %
Length counter: 0.000 km
Current production: 0 kg
Number of stoppages: 0
Number of lap changes: 0

Start of shift: 12.09.2016 10:00
End of shift: 12.09.2016 14:00

*Figure 74: Data screen 11.1 Current shift*

The data screen 11.1 shows the machine data for the current shift. All values are 0 when the current shift starts.

#### 7.4.11.2 Data Screen 11.2



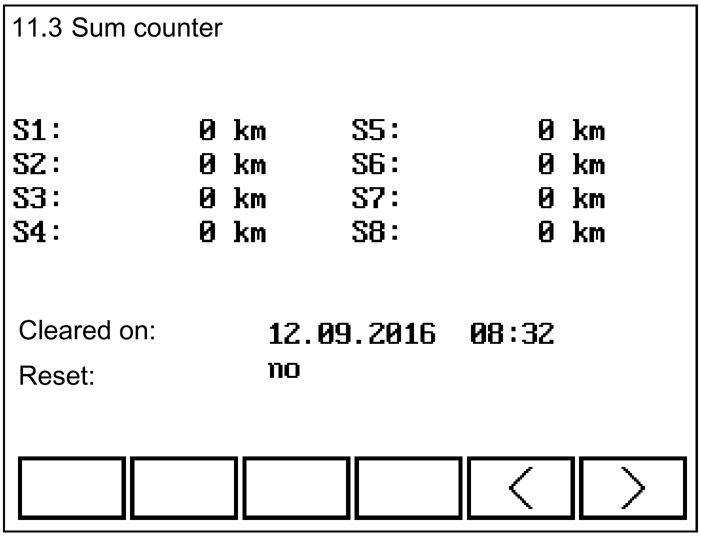
11.2 Overview of shifts

| Shift | km | % | Start of shift | |
|---|---|---|---|---|
| S2(Act) | 0 | 0.1 | 12.09.2016 | 10:00 |
| S1 | 0 | 0.5 | 12.09.2016 | 06:00 |
| S1 | 0 | 0.0 | 12.09.2016 | 00:00 |
| S0 | 0 | 0.0 | 00.00.0000 | 00:00 |
| S0 | 0 | 0.0 | 00.00.0000 | 00:00 |
| S0 | 0 | 0.0 | 00.00.0000 | 00:00 |
| S0 | 0 | 0.0 | 00.00.0000 | 00:00 |

*Figure 75: Data screen 11.2 Overview of shifts*

The data screen 11.2 is shows the overview of production and the machine efficiency for the current shift and the last 6 shifts.

### 7.4.11.3 Data Screen 11.3



11.3 Sum counter

| | | | |
|---|---|---|---|
| S1: | 0 km | S5: | 0 km |
| S2: | 0 km | S6: | 0 km |
| S3: | 0 km | S7: | 0 km |
| S4: | 0 km | S8: | 0 km |

Cleared on: 12.09.2016 08:32

Reset: no

*Figure 76: Data screen 11.3 Sum counter*

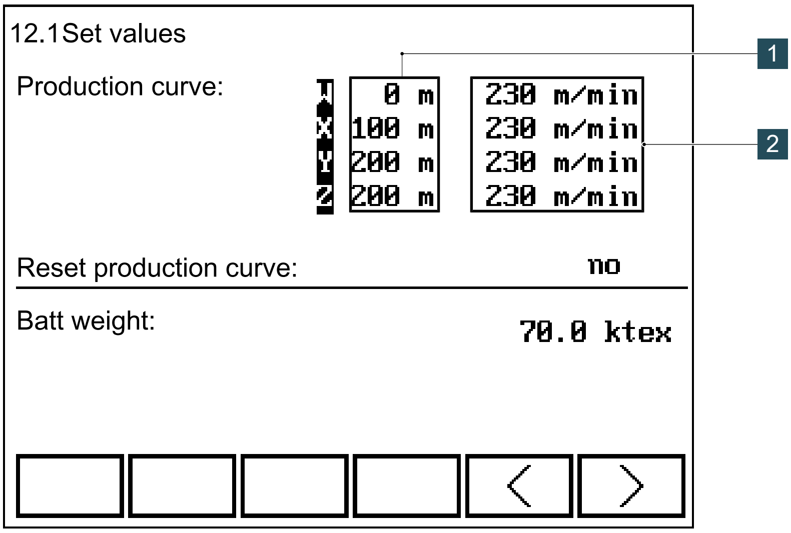
The data screen 11.3 shows the total productions in kilometer of all 8 shifts. The total productions are shown from the date when the user reset the production values of all shifts.

**Cleared on:** The value is the date when the user deleted all production values in data screen 11.3.

### 7.4.12 Menu 12

The menu **12 Set values production** is used to do some settings of production.

### 7.4.12.1 Data Screen 12.1(with VARIOspeed)



12.1Set values

Production curve:

| | | |
|---|---|---|
| W | 0 m | 230 m/min |
| X | 100 m | 230 m/min |
| Y | 200 m | 230 m/min |
| Z | 200 m | 230 m/min |

Reset production curve: no

Batt weight: 70.0 ktex

Figure 77: Data screen 12.1 Set values(with VARIOSpeed)

The data screen 12.1 is used to set the lap length and the production speed when the VARIOspeed function is enabled.

**Production curve:** The field 1 shows the range of the lap length.

The field 2 shows the production speed for each range.

Default production speed:180 m/min

Range of the production speed: 80 – 230 m/min

**W**

The lap length is always 0 for the row W. The machine starts with the winding speed that is shown in the row W.

**W – X**

In the first range of the lap length, the winding speed keeps same as the value that is shown in the row X.

**X – Y**

In the second range of the lap length, the winding speed changes linearly from the winding speed that is shown in the row X to the row Y.

**Y – Z**

In the third range of the lap length, the winding speed changes linearly from the winding speed that is shown in the row Y to the row Z.

**Z**

The value in this row is the default value of the total lap length. When the production lap length is the same as this default value, the lap is changed.

Default of the total lap length: 300 m

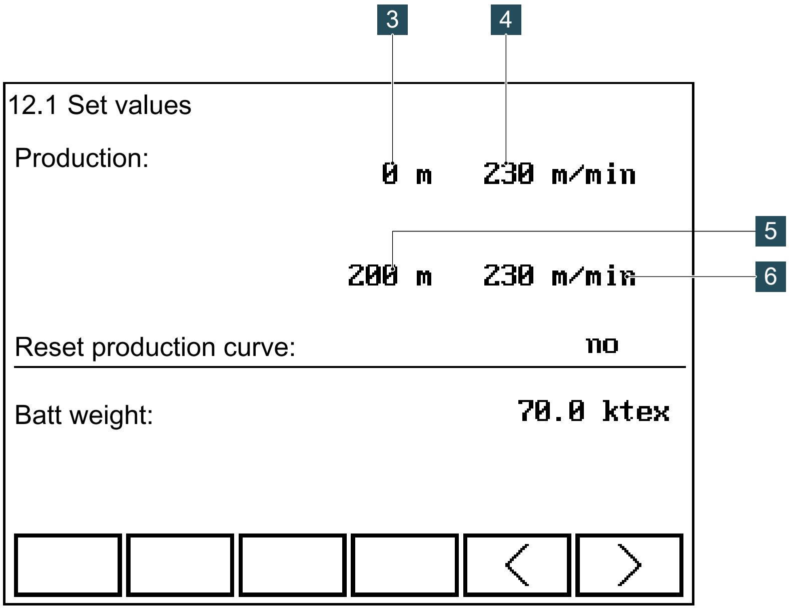
Range of the total lap length: 1 – 350 m

**Reset production curve:** The user can select **Yes** to delete all production values.

**Batt weight:** This value is used to calculate the production.

Range: 10 – 100 tex

### 7.4.12.2 Data Screen 12.1(without VARIOspeed)



12.1 Set values

Production: 0 m 230 m/min

200 m 230 m/min

Reset production curve: no

Batt weight: 70.0 ktex

*Figure 78: Data screen 12.1 Set values(without VARIOspeed)*

The data screen 12.1 is used to set the lap length, the production speed, and the batt weight.

**Production:** The value 3 is the actual lap length that is made.

The value 4 is the production speed. The user can set the production speed with the numeric keypad.

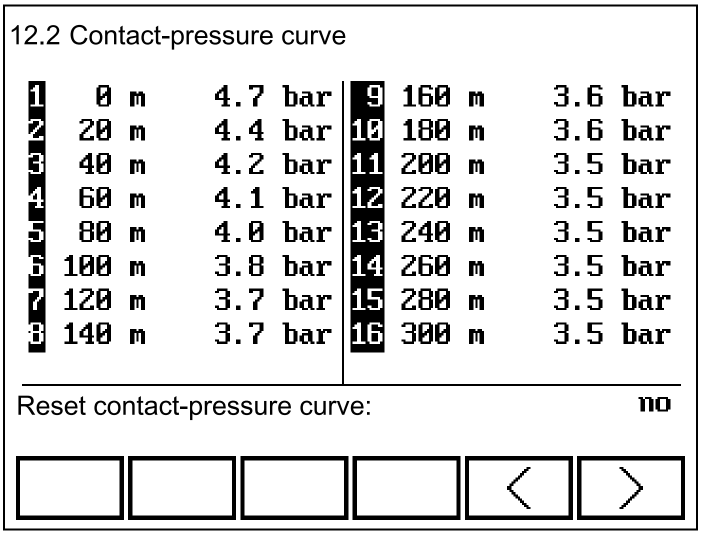
The value 5 is the default total lap length. When the actual lap length is the same as the value 5, the lap is changed.

**Reset production curve:** The user can select **Yes** to delete all production values.

**Batt weight:** This value is used to calculate the production.

Range: 10 – 100 tex

### 7.4.12.3 Data Screen 12.2



12.2 Contact-pressure curve

| | | | | | |
|---|---|---|---|---|---|
| 1 | 0 m | 4.7 bar | 9 | 160 m | 3.6 bar |
| 2 | 20 m | 4.4 bar | 10 | 180 m | 3.6 bar |
| 3 | 40 m | 4.2 bar | 11 | 200 m | 3.5 bar |
| 4 | 60 m | 4.1 bar | 12 | 220 m | 3.5 bar |
| 5 | 80 m | 4.0 bar | 13 | 240 m | 3.5 bar |
| 6 | 100 m | 3.8 bar | 14 | 260 m | 3.5 bar |
| 7 | 120 m | 3.7 bar | 15 | 280 m | 3.5 bar |
| 8 | 140 m | 3.7 bar | 16 | 300 m | 3.5 bar |

Reset contact-pressure curve: no

*Figure 79: Data screen 12.2 Contact-pressure curve*

The data screen 12.2 is used to set the pressure contour for the lap compression.

**Contact-pressure curve**

The lap formation procedure is divided into 16 steps. For each step, the pressure value can be set individually. A phase is specified by the length (in meter) of the wound batt.

The user can change the start and the end of each phase with the numeric keypad.

Row **1** is the first phase of the lap formation that starts with 0 m and completes with the lap length value in the row **2**.

Default value of pressure for the phase **1**: 4.7 bar

The min. – max: 2.9 – 5.9 bar

Default value of pressure for the phase **2 to 15**: 4.4 to 3.5 bar

The min. – max.: 2.9 – 5.9 bar

Default value of pressure for the phase **16**: 3.5 bar

The min. – max.: 2.9 – 5.9 bar

**Reset contact-pressure curve:**

This function is used to make the standard pressure curve.

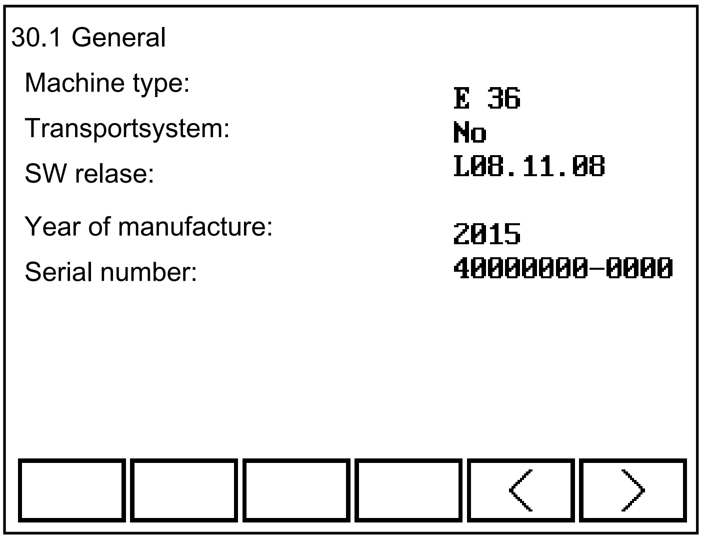
It is recommended to use the standard pressure curve.

The user selects **Yes** in the field **Reset contact-pressure curve:** to start this function.

### 7.4.13 Menu 30

The menu **30 Information general** contains the general information about the machine.

### 7.4.13.1 Data Screen 30.1



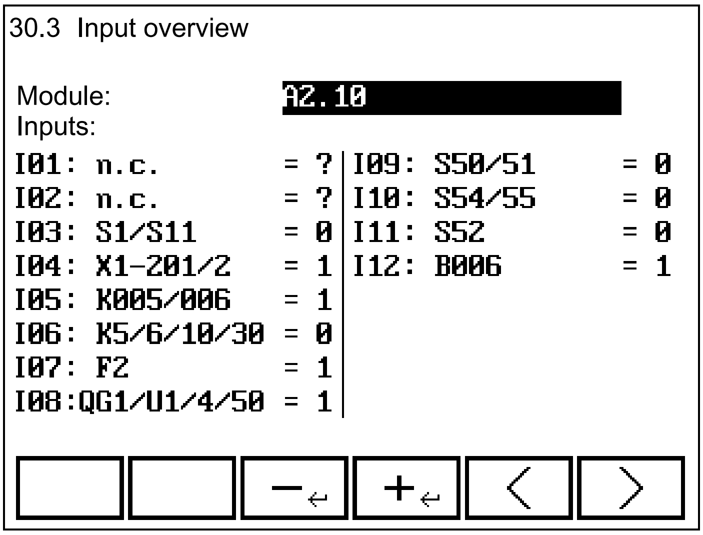
30.1 General

Machine type: E 36
Transportsystem: No
SW relase: L08.11.08
Year of manufacture: 2015
Serial number: 40000000-0000

*Figure 80: Data screen 30.1 General*

The data screen 30.1 shows general information about the machine.

### 7.4.13.2 Data Screen 30.3



30.3 Input overview

Module: A2.10
Inputs:

```
I01: n.c.       = ?│I09: S50/51     = 0
I02: n.c.       = ?│I10: S54/55     = 0
I03: S1/S11     = 0│I11: S52        = 0
I04: X1-201/2   = 1│I12: B006       = 1
I05: K005/006   = 1│
I06: K5/6/10/30 = 0│
I07: F2         = 1│
I08:QG1/U1/4/50 = 1│
```

*Figure 81: Data screen 30.3 Input overview*

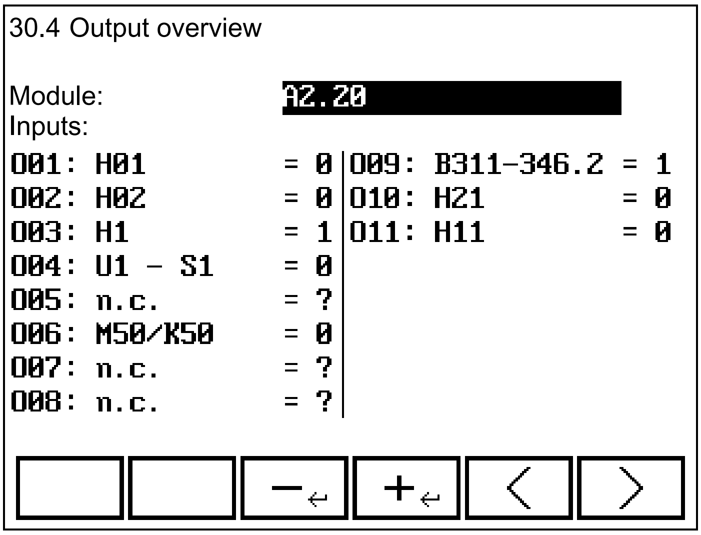
The data screen 30.3 shows the status of the control unit.

**Module:** The user can select the I/O module with the button [Plus]/ [Minus] to examine the status of control unit.

**Inputs:** The value 0 shows that there is no voltage is examined.

The value 1 shows that the voltage is examined.

### 7.4.13.3 Date Screen 30.4



```
30.4 Output overview

Module:             A2.20
Inputs:
001: H01         = 0|009: B311-346.2 = 1
002: H02         = 0|010: H21        = 0
003: H1          = 1|011: H11        = 0
004: U1 - S1     = 0|
005: n.c.        = ?|
006: M50/K50     = 0|
007: n.c.        = ?|
008: n.c.        = ?|
```

*Figure 82: Data screen 30.4 Output overview*

The data screen 30.4 shows the output status of the control unit.

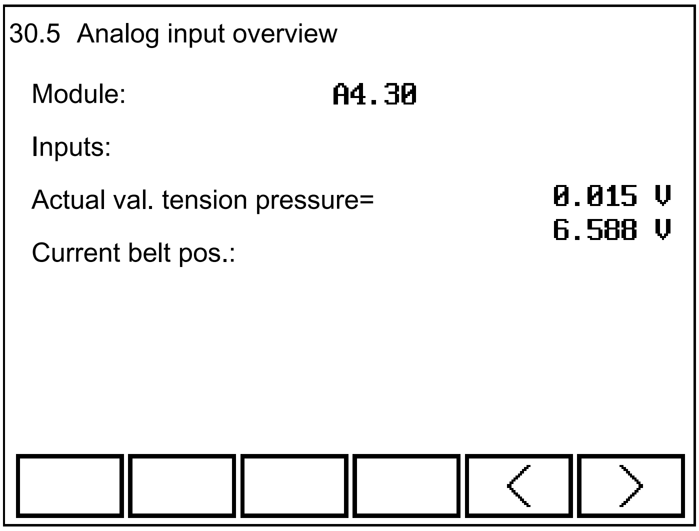
**Module:** The user can select the I/O module with the button [Plus]/ [Minus] button to examine the status of control unit.

**Inputs:** The value 0 shows that no voltage is examined.

The value 1 shows that the voltage is examined.

The words ‘n.c’ means ‘not connected’.

### 7.4.13.4 Data Screen 30.5



```
30.5  Analog input overview

  Module:                 A4.30

  Inputs:

  Actual val. tension pressure=       0.015 V
                                      6.588 V
  Current belt pos.:
```

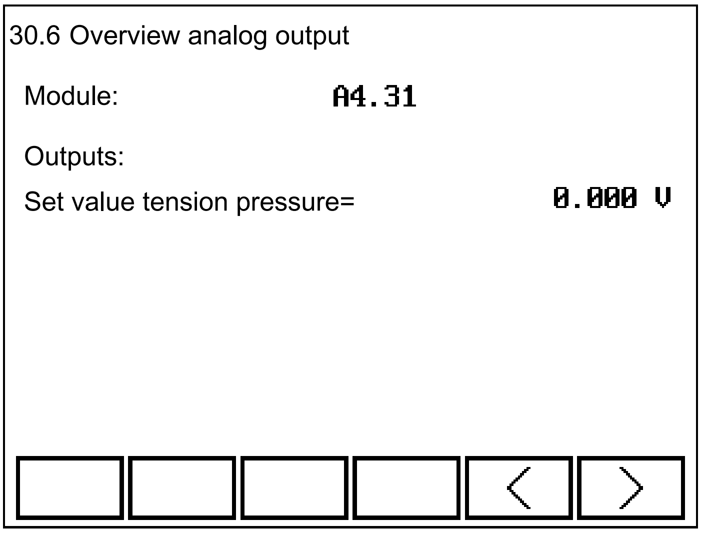
*Figure 83: Data screen 30.5 Analog input overview*

The data screen 30.5 is used to examine the functions or troubleshooting of the pressure regulating valve for the tension lever cylinder.

**Actual val. tension pressure=** The value is the actual voltage that is measured by the pressure regulating valve.

The pressure regulating valve measures the pressure in bars and changes the measured value to a related voltage.

### 7.4.13.5 Data Screen 30.6



30.6 Overview analog output

Module: A4.31

Outputs:

Set value tension pressure= 0.000 V

*Figure 84: Data screen 30.6 Overview analog output*

The data screen 30.6 is used to examine the functions or troubleshooting of the pressure regulating valve for the tension lever cylinder.

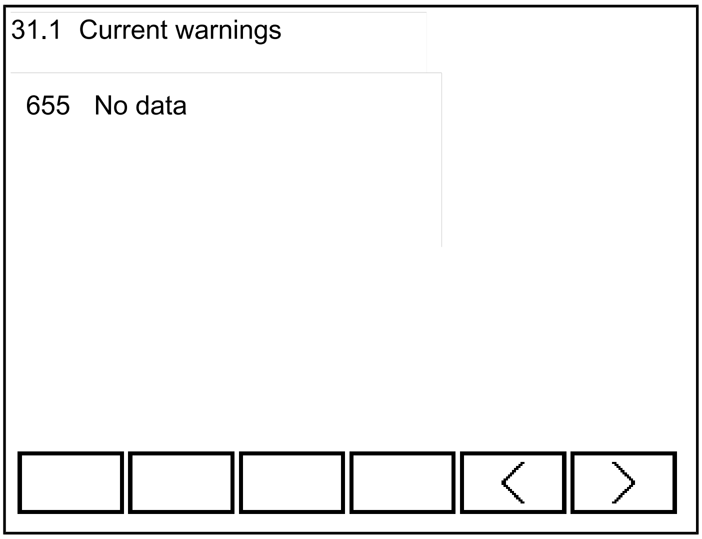
**Set value tension pressure=** The value shows the target value in volts that is specified by the regulating valve.

The control unit changes the pressure contour specifications to a value in volts in data screen 12.2.

### 7.4.14 Menu 31

The menu **31 Information protocols/statistics** contains logs and statistics.

### 7.4.14.1 Data Screen 31.1



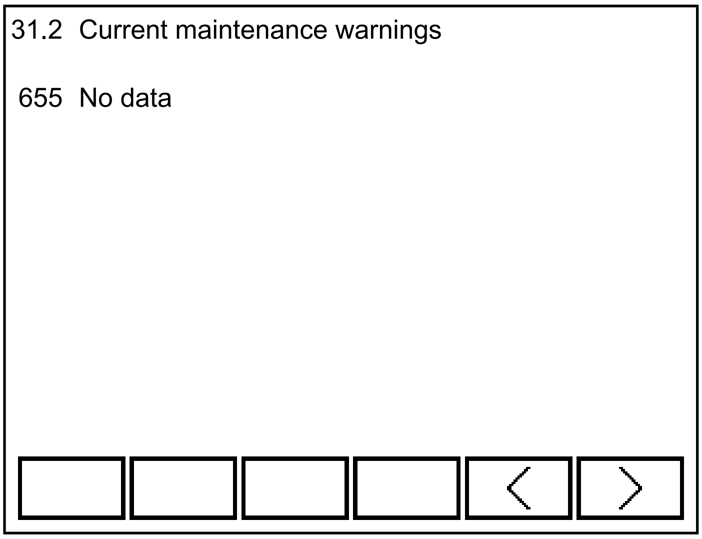
31.1 Current warnings

655 No data

*Figure 85: Data screen 31.1 Current warnings*

The data screen 31.1 shows the code, the error texts, and the time of warning messages.

### 7.4.14.2 Data Screen 31.2



31.2 Current maintenance warnings

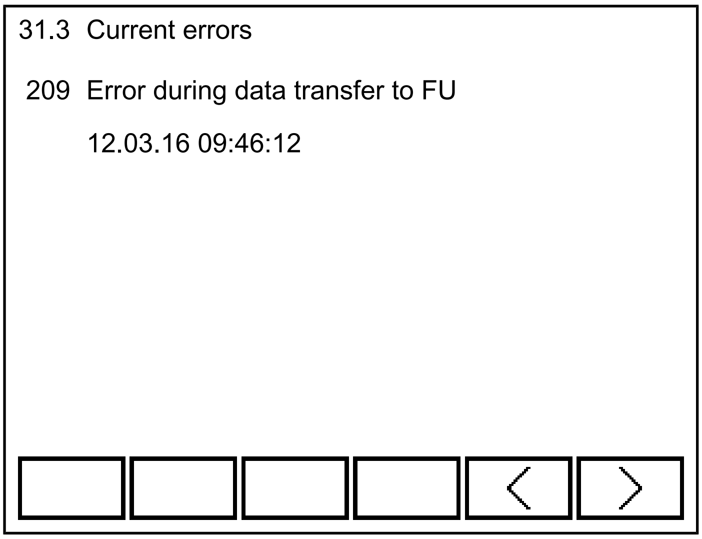
655 No data

*Figure 86: Data screen 31.2 Current maintenance warnings*

The data screen 31.2 shows the code, the texts, and the time of maintenance warnings.

The data screen 31.2 shows a maximum of 100 warning messages for the machine maintenance.

### 7.4.14.3 Data Screen 31.3



31.3 Current errors

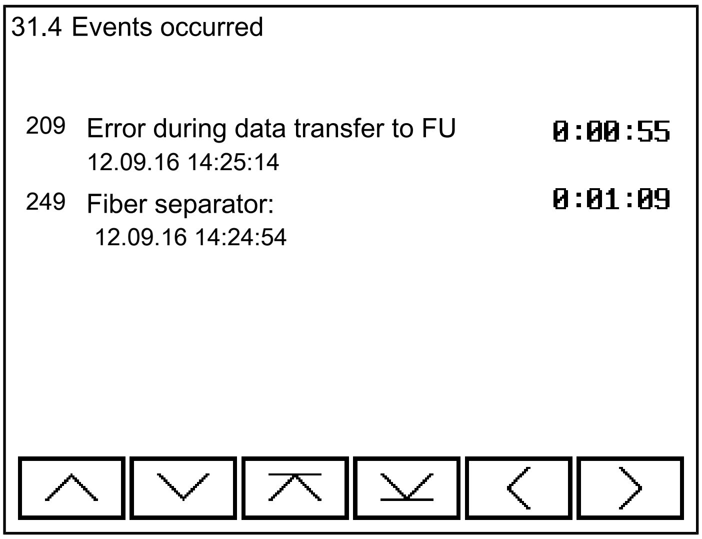
209 Error during data transfer to FU
12.03.16 09:46:12

*Figure 87: Data screen 31.3 Current errors*

The data screen 31.3 shows the code, the texts, and the time of the current error messages.

The data screen 31.3 shows a maximum of 100 error messages.

### 7.4.14.4 Data Screen 31.4



31.4 Events occurred

209 Error during data transfer to FU 0:00:55
12.09.16 14:25:14

249 Fiber separator: 0:01:09
12.09.16 14:24:54

*Figure 88: Data screen 31.4 Events occurred*

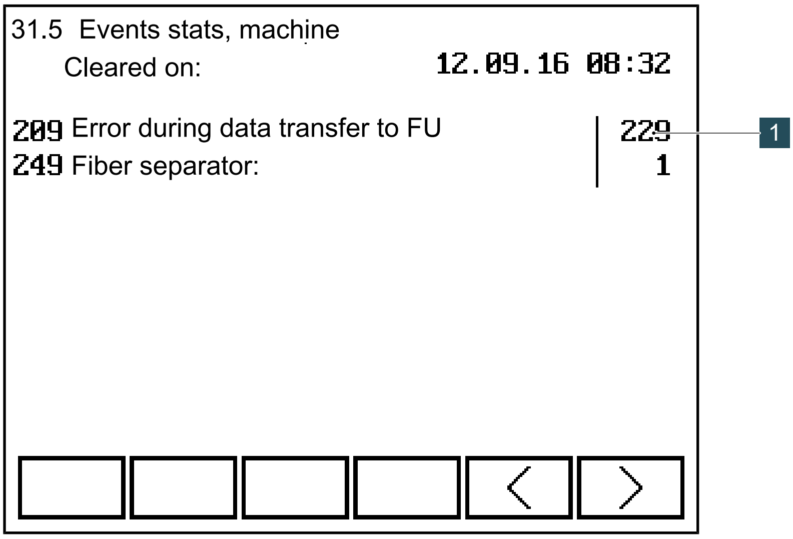
The data screen 31.4 shows the most-recent history of the events (maximum 100 events).

The data screen 31.4 shows the following information:

- The code
- The message text

- The date and time when an event occurred
- The duration that the event lasted in the machine

### 7.4.14.5 Data Screen 31.5


31.5 Events stats, machine
Cleared on: 12.09.16 08:32

209 Error during data transfer to FU 229
249 Fiber separator: 1

*Figure 89: Data screen 31.5 Events stats, machine*

The data screen 31.5 shows the list of the most important events (alarms, faults, and warning messages) since the date of the last **Cleared on:** .

The value 1 shows the number of times that the event occurred since the date of the last **Cleared on:** .

### 7.4.14.6 Data Screen 31.6

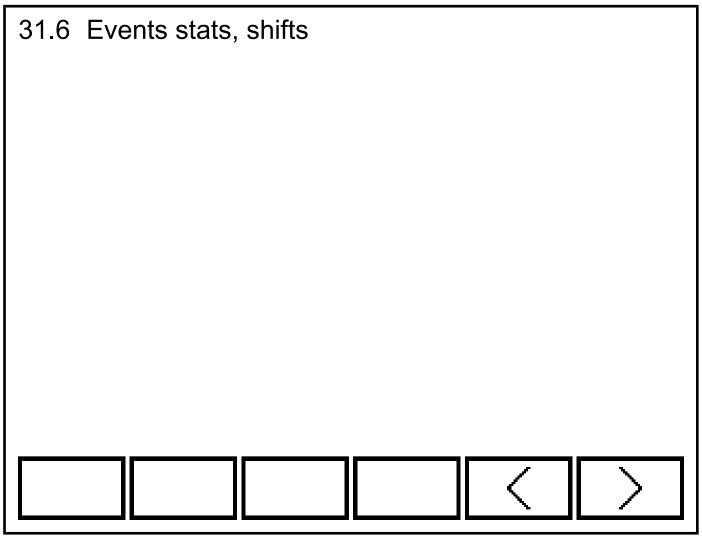
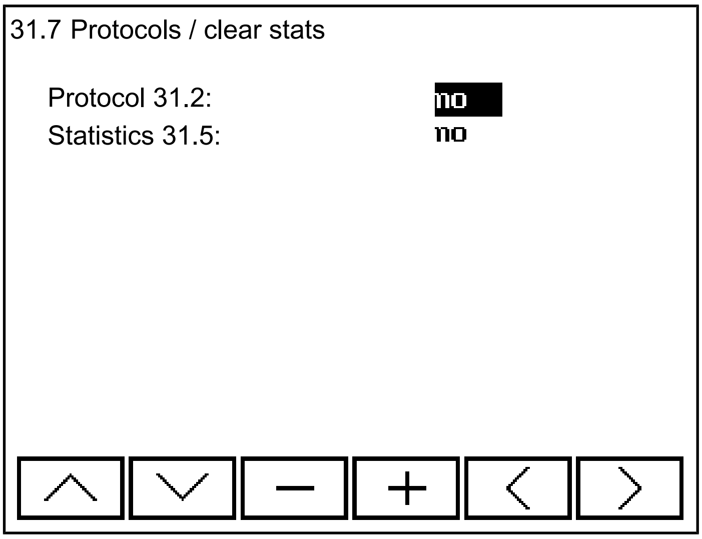

31.6 Events stats, shifts

*Figure 90: Data screen 31.6 Events stats, shifts*

The data screen 31.6 shows the most important events (alarm and messages) for the machine, the current shift, and the most-recent 4 shifts.

### 7.4.14.7 Data Screen 31.7



31.7 Protocols / clear stats

Protocol 31.2: no
Statistics 31.5: no

*Figure 91: Data screen 31.7 Protocols / clear stats*

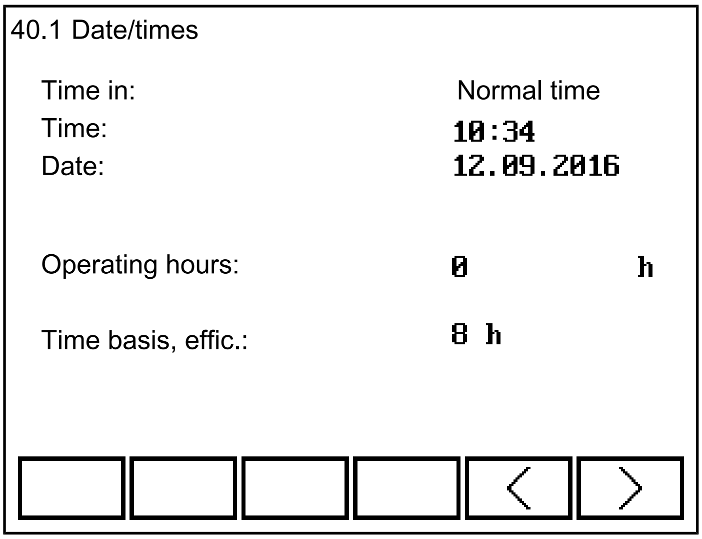
The data screen 31.7 is used to delete the history of events.

Select **Yes** to delete the history of events for a specified data screen.

## 7.4.15 Menu 40

The menu **40 Setup values general** is used to do the general settings of the machine.

### 7.4.15.1 Data Screen 40.1



40.1 Date/times

Time in: Normal time
Time: 10:34
Date: 12.09.2016

Operating hours: 0 h

Time basis, effic.: 8 h

*Figure 92: Data screen 40.1 Date/times*

The data screen 40.1 is used to set the date and the time.

**Time in:** Tap the program key [Plus] or [Minus] to select **Normal time** or **Summer time** .

**Time:** Tap the program keys to set the time.

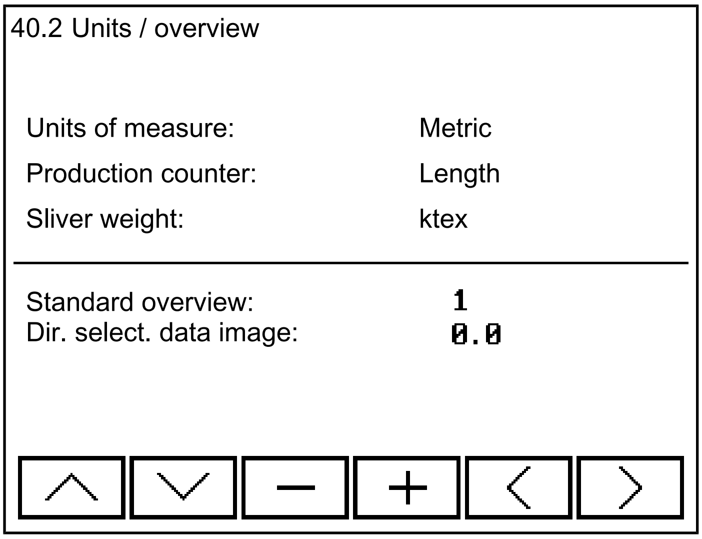
**Date:** Tap the program keys to set the date.

**Operating hours:** The CPU operating hours are set when a CPU is replaced.

**Time basis, effic.:** The value is the time base to calculate the rolling machine efficiency. The value is set to to 2 h, 4 h, or 8 h.

If a shorter base time is selected, the effect of the events, such as machine stops, on the efficiency of the machine shows more quickly.

### 7.4.15.2 Data Screen 40.2



40.2 Units / overview

Units of measure: Metric
Production counter: Length
Sliver weight: ktex

Standard overview: 1
Dir. select. data image: 0.0

*Figure 93: Data screen 40.2 Units / overview*

The data screen 40.2 is used to set the units, the default overview, and the data screen that is connected to the program key [Direct Next].

The user can tap the program key [Minus] or [Plus] to select the values as follows.

**Units of measure:** The possible values for this item are as follows:

- **Metric**
- **English**

**Production counter:** The possible values for this item are as follows:

- **Length**
- **Weight**

**Sliver weight:** The possible values for this item are as follows:

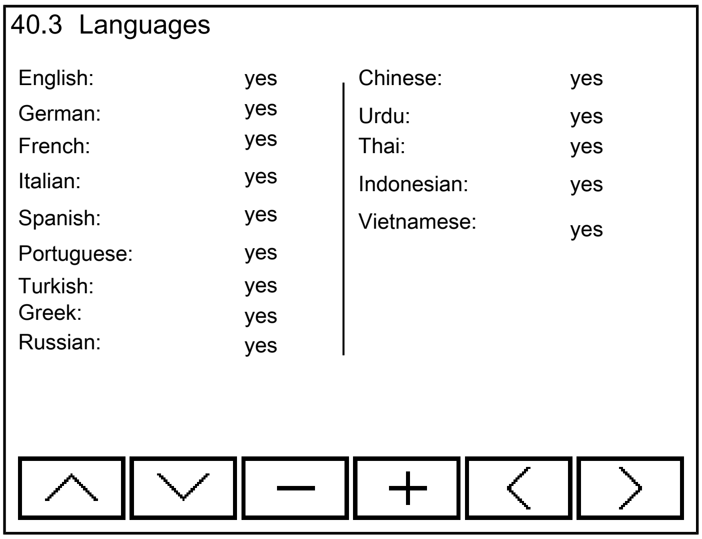
- **tex**
- **ktex**

- **Ne**
- **Nm**
- **gr/yd**

**Standard overview:** The standard overview screen shows automatically after the time-out. If there are some overview screens, the user can set one of these data screens as the standard overview screen.

**Dir. select. data image:** The user can enter the code of a data screen to set the data screen that connects to the program key [Direct Next]. If the user pushes the program key [Direct Next], the set data screen shows directly.

### 7.4.15.3 Data Screen 40.3



40.3 Languages

English: yes
German: yes
French: yes
Italian: yes
Spanish: yes
Portuguese: yes
Turkish: yes
Greek: yes
Russian: yes

Chinese: yes
Urdu: yes
Thai: yes
Indonesian: yes
Vietnamese: yes

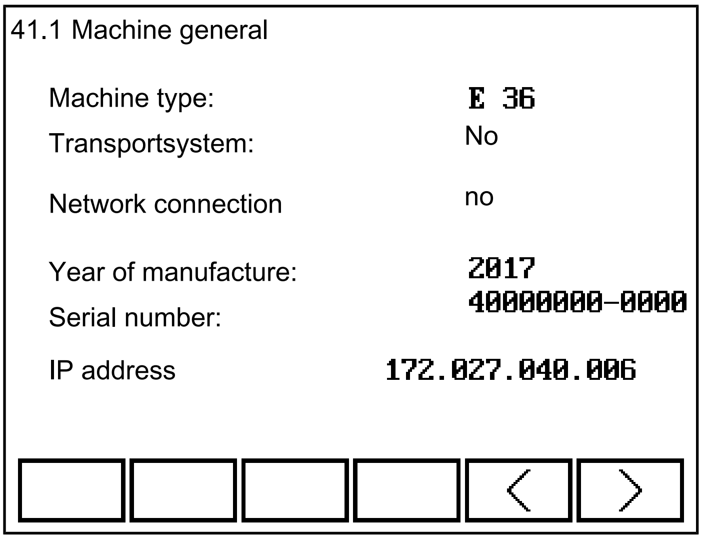
Figure 94: Data screen 40.3 Languages

The data screen 40.3 is used to activate or deactivate a language in the selections of the key [Language Selection]. If one of the languages is selected with **yes** , this language shows when the user taps the key [Language Selection].

### 7.4.16 Menu 41

The menu **41 Setup values machine** is about the configuration of parameters of the machine.

### 7.4.16.1 Data Screen 41.1



41.1 Machine general

Machine type: E 36
Transportsystem: No
Network connection no
Year of manufacture: 2017
Serial number: 40000000-0000
IP address 172.027.040.006

*Figure 95: Data screen 41.1 Machine general*

The data screen 41.1 is used to edit the general information of the machine.

The first 3 configurations can only be edited with an overriding password.

**Machine type:** The machine type has to match the machine type information that is shown on the CE identification plate of the transport system.

**Transportsystem:** The **Transportsystem:** information has to match the information that is shown on the CE identification plate of the transport system.

The field has the following possible setting values:

- **No**
- **SERVOtrolley** (transport system with a lap trolley)
- **SERVOmag** (1 magazine for 8 laps without transport system)
- **SERVOlap** (fully automatic transport system)

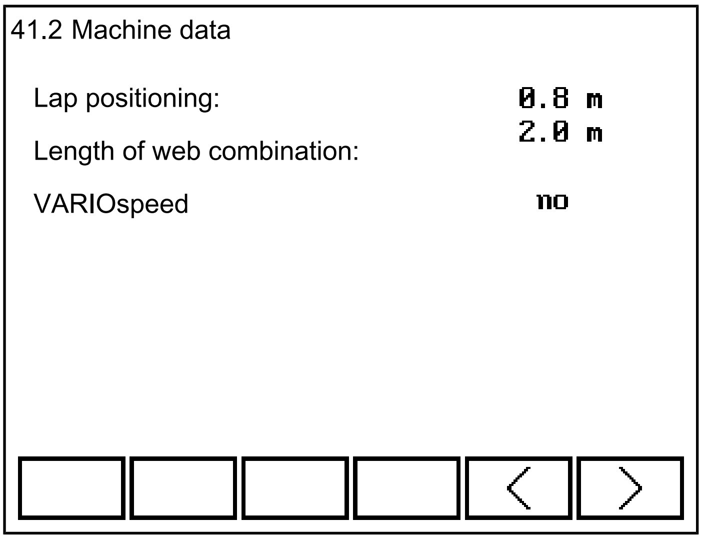
**Network connection** If the machine is connected to the SPIDERweb, select **yes** .

If the machine is not connected to the SPIDERweb, select **no** .

**Year of manufacture:** This shows the year that the machine is made.

**IP address** Address for network connection. The address must match the data in the network configuration.

### 7.4.16.2 Data Screen 41.2



41.2 Machine data

Lap positioning: 0.8 m

Length of web combination: 2.0 m

VARIOspeed no

*Figure 96: Data screen 41.2 Machine data*

The machine data is set in the data screen 41.2.

**Lap positioning:** The length gives the detachment position for the ejected lap.

Default: 1.5 m

Range of the value: 1 m – 5 m

**Length of web combination:** Default: 2 m

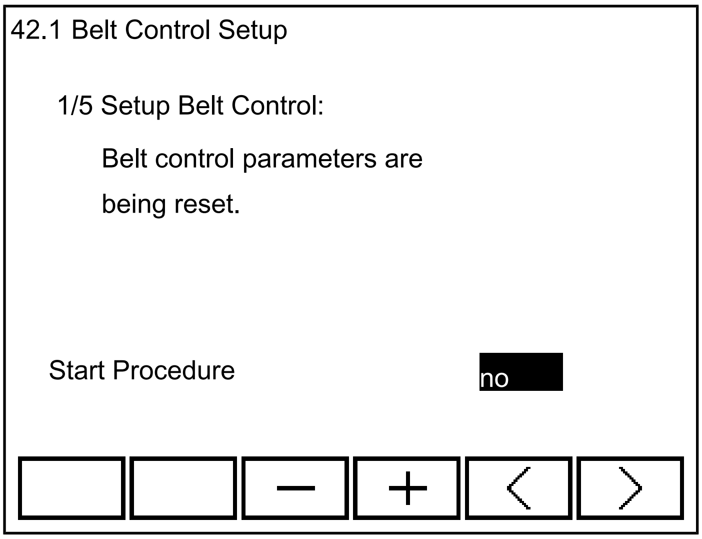
Range of the value: 1 m – 6 m

**VARIOspeed** Tap the program key [Minus] or [Plus] to activate or deactivate the VARIOspeed function.

### 7.4.17 Menu 42

The menu **42 Setup belt adjustment** has the data screens to do the lap belt control adjustment.

### 7.4.17.1 Data Screen 42.1



42.1 Belt Control Setup

1/5 Setup Belt Control:

Belt control parameters are being reset.

Start Procedure no

*Figure 97: Data screen 42.1 Belt Control Setup*

In the data screen 42.1, the belt control mechanism is set in 5 steps as follow:

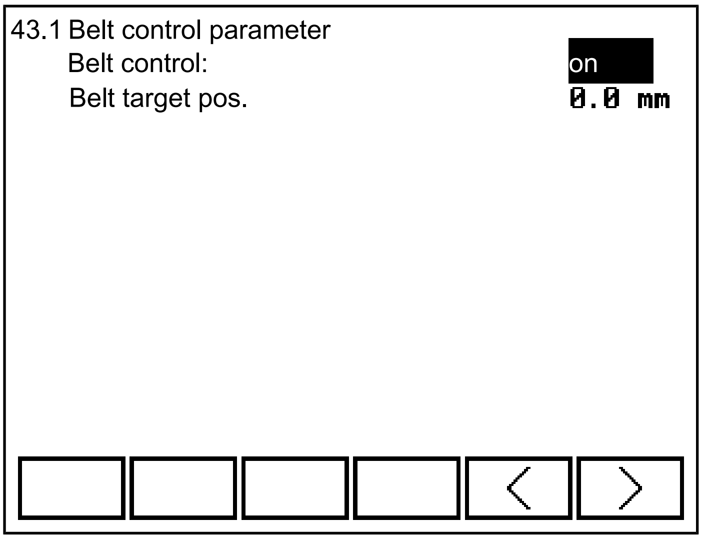
- **1/5 Setup Belt Control:**
- **2/5 Sensor referencing and first run:**
- **3/5 Set reference position:**
- **4/5 Calibration: automatic**
- **5/5 End:**

The user can select **yes** to start the set-up procedure.

### 7.4.18 Menu 43

The menu 43 Belt adjustmnt. paramtr./act. values are used to do some settings of the lap belt.

### 7.4.18.1 Data Screen 43.1



43.1 Belt control parameter

Belt control: on

Belt target pos. 0.0 mm

*Figure 98: Data screen 43.1 Belt control parameters are*

The data screen 43.1 is used to set the belt control parameter.

**Belt control:** The user pushes the program key [Minus] or [Plus] to activate or deactivate the control mechanism.

**Belt target pos.** The value shows the target position of the lap belt.

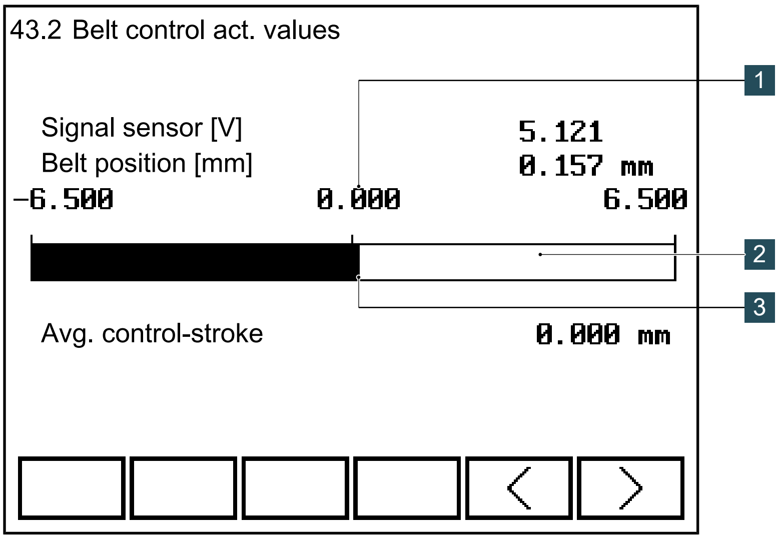
The user can decrease the value to make the target position of the belt move to the left side (in direction of the sensor).

The user can increase the value to make the target position of the belt move to the right side.

Default: 0.000 mm

Range of the value: -6.500 mm – +6.500 mm

### 7.4.18.2 Data Screen 43.2



43.2 Belt control act. values

Signal sensor [V] 5.121
Belt position [mm] 0.157 mm

-6.500 0.000 6.500

Avg. control-stroke 0.000 mm

*Figure 99: Data screen 43.2 Belt control act. values*

The data screen 43.2 shows the actual values of the lap belt control.

**Signal sensor [V]** The actual condition is shown as an electrical voltage.

**Belt position [mm]** The value shows the position of the lap belt in relation to the target position.

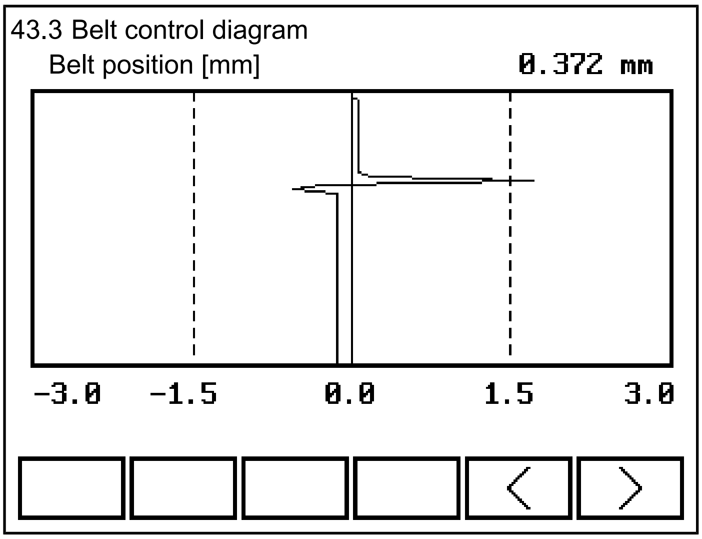
**The bar diagram 2** The bar diagram 2 shows the actual position of the belt. In the diagram, the white part is for the belt. The edge 3 of white bar is for the left edge of the lap belt.

The data screen 43.2 shows that the left edge of the lap belt is at the right side of the target position 1 with a distance of 0.157 mm.

**Avg. control-stroke** When a lap is changed, the control mechanism calculates again the position in relation to the last lap formation procedure.

When the value of **Avg. control-stroke** is in the range from - 0.500 mm to + 0.500 mm, the belt control mechanism is set up correctly.

#### 7.4.18.3 Data Screen 43.3



43.3 Belt control diagram

Belt position [mm] 0.372 mm

*Figure 100: Data screen 43.3 Belt control diagram*

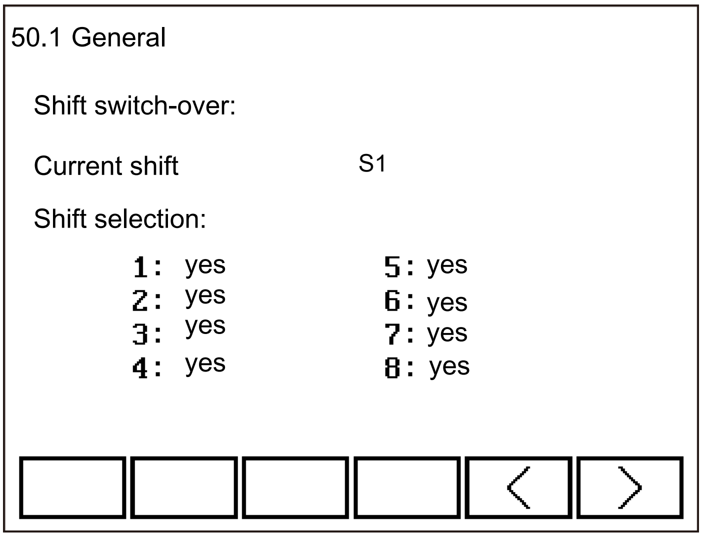
The diagram in the data screen 43.3 shows the change of the lap belt position during the lap formation.

For example, if the curve changes to the left side, the lap belt moves to the left side.

### 7.4.19 Menu 50

The menu **50 Shift plan** is about the configuration of shifts.

#### 7.4.19.1 Data Screen 50.1



50.1 General

Shift switch-over:

Current shift S1

Shift selection:

1: yes
2: yes
3: yes
4: yes
5: yes
6: yes
7: yes
8: yes

*Figure 101: Data screen 50.1 General*

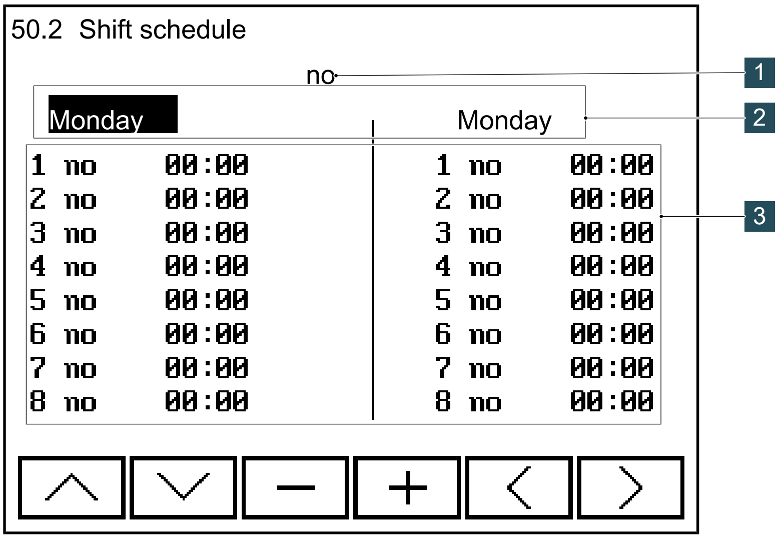
The data screen 50.1 is used to set the shift schedule.

**Shift switch-over:** The user can select **Key** to select the manual shift change in the field **Shift switch-over:** . The user can set **yes** for necessary shift to select the shift in the field **Shift selection:** .

The user can select **Shift schedule** to select the automatic shift change. If select the automatic shift changeover, the user needs to set the shift schedule in data screen 50.2.

**Shift selection:** The user can select **yes** to start the necessary shifts.

### 7.4.19.2 Data Screen 50.2



```
50.2  Shift schedule
                         no
  Monday                          Monday
1 no      00:00           1 no      00:00
2 no      00:00           2 no      00:00
3 no      00:00           3 no      00:00
4 no      00:00           4 no      00:00
5 no      00:00           5 no      00:00
6 no      00:00           6 no      00:00
7 no      00:00           7 no      00:00
8 no      00:00           8 no      00:00
```

*Figure 102: Data screen 50.2*

The data screen 50.2 is used to make the shift schedule for a week.

**Copy function 1** If the user selects **copy all** , the shift schedule in left column copies all other days of the week.

If the user selects **copy to** , the shift schedule in left column copies to the specified day 2.

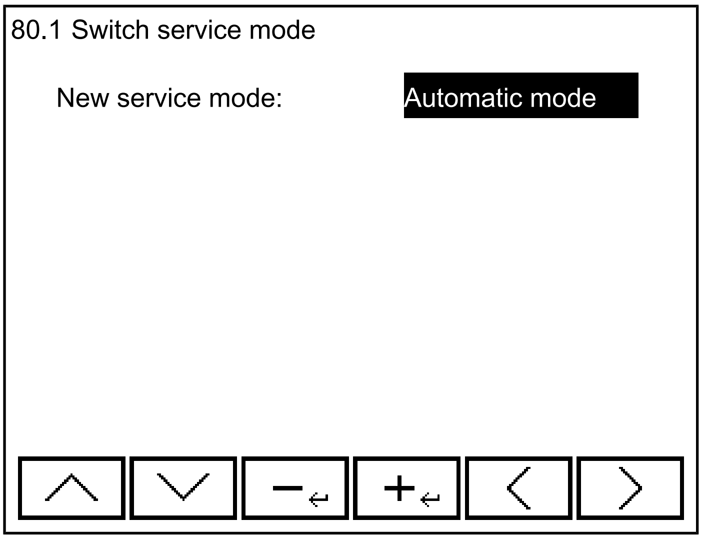
**Making Shift schedule 3** The user can tap the program key [Minus] or [Plus] to select the day of the week.

Each day has maximum 8 shifts. The user can select **yes** to activate the shift.

### 7.4.20 Menu 80

The menu **80 Change service modes** is used to change the operating mode.

### 7.4.20.1 Data Screen 80.1



80.1 Switch service mode

New service mode: Automatic mode

*Figure 103: Data screen 80.1 Switch service mode*

The data screen 80.1 is used to select the service mode and the automatic mode.

The machine must be at a standstill before the mode can be changed.

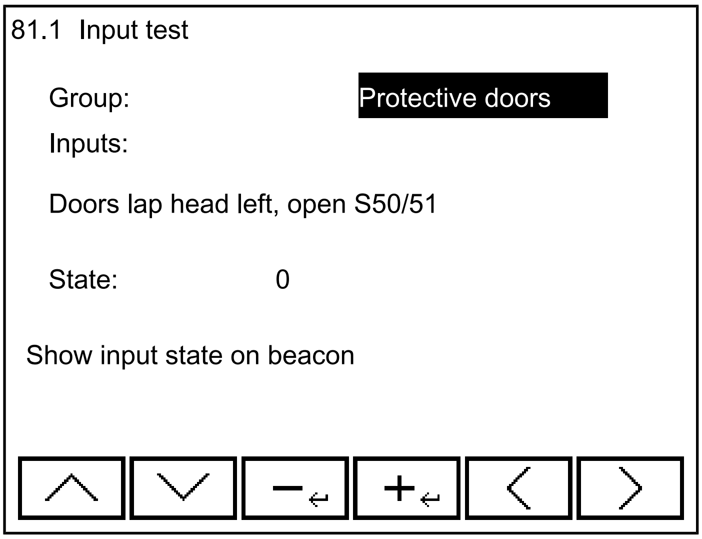
**New service mode:** The user taps the program key [Minus Enter] or [Plus Enter] to select the mode.

- The **Service mode** is used to do the maintenance work and tests for the machine. In the **Service mode**, the user has access to all functions in test menus.
- The **Automatic mode** is used for the production.

### 7.4.21 Menu 81

The menu **81 Test inputs/outputs** has the following data screens:

### 7.4.21.1 Data Screen 81.1



81.1 Input test

Group: Protective doors

Inputs:

Doors lap head left, open S50/51

State: 0

Show input state on beacon

*Figure 104: Data screen 81.1 Input test*

The data screen 81.1 is used to do the test of the inputs of each group.

**Group:** The user taps the program key [Minus Enter] or [Plus Enter] to select a group for input test.

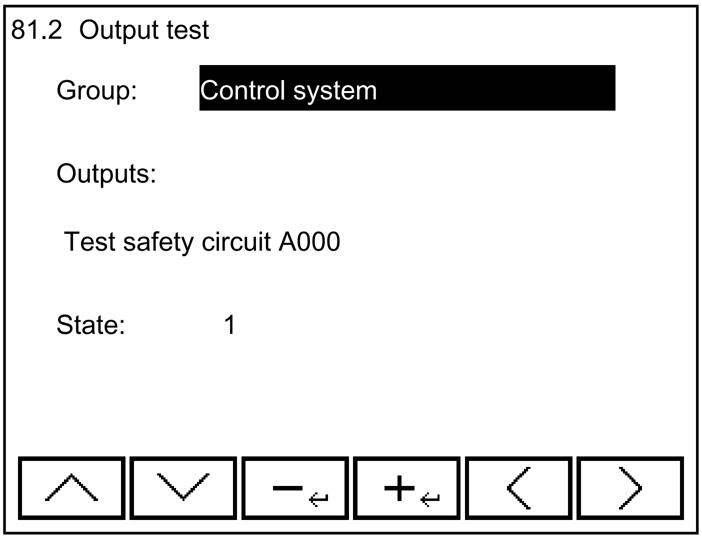
The **Group:** contains the following input groups:

- **Protective doors**
- **Control system**
- **Safety circuit**
- **End pos. lap head**
- **End positions tube feed**
- **End pos. long. part**

**State:** The explanations for the condition are as follows:

- The value 0 shows that there is no voltage.
- The value 1 shows that there is voltage.

### 7.4.21.2 Data Screen 81.2



81.2 Output test

Group: Control system

Outputs:

Test safety circuit A000

State: 1

*Figure 105: Data screen 81.2 Output test*

The data screen 81.2 is used to the test of the outputs of each group.

**Group:** The user can tap the program key [Minus Enter] or [Plus Enter] to select a group for the output test.

The **Group:** contains the following output groups:

- **Control system**
- **Beacons**
- **lap head**
- **Tube feed**
- **Longitudinal part**

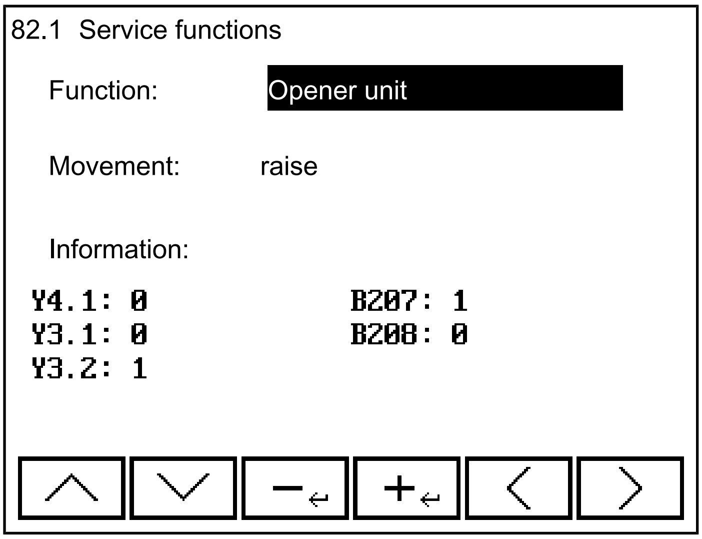
**State:** The explanations for the conditions are as follows:

- The value 0 shows that there is no voltage.
- The value 1 shows that there is voltage.

### 7.4.22 Menu 82

The menu **82 Service functions** has the following data screen:

### 7.4.22.1 Data Screen 82.1



82.1 Service functions

Function: Opener unit

Movement: raise

Information:

Y4.1: 0
Y3.1: 0
Y3.2: 1
B207: 1
B208: 0

*Figure 106: Data screen 82.1 Service functions*

The data screen 82.1 is used to do the function tests.

Before the function tests, the user must make sure that:

- The machine is at a standstill
- The machine is in the service mode in the data screen 80.1

**Function:** The user can tap the program key [Minus Enter] or [Plus Enter] to select a necessary unit to do function test.

**Movement:** The user can tap the program key [Minus Enter] or [Plus Enter] to select the movement. The user can push the key [Start] to start the movement.

**Information:** The information shows the status of the sensors and actuators that are related to the function.

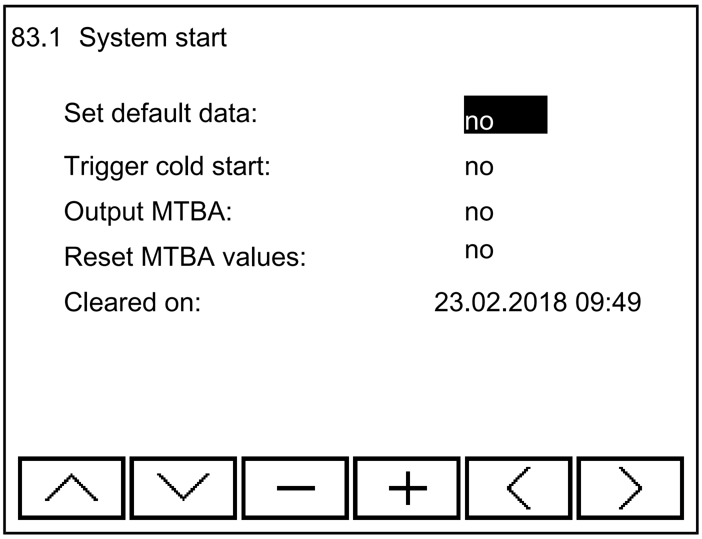
The explanations for the values in the field of **Information:** are as follows:

- The value 0 shows that there is no voltage.
- The value 1 shows that there is voltage.

### 7.4.23 Menu 83

The menu **83 System functions** contains the following data screens:

### 7.4.23.1 Data Screen 83.1



83.1 System start

Set default data: no
Trigger cold start: no
Output MTBA: no
Reset MTBA values: no
Cleared on: 23.02.2018 09:49

*Figure 107: Data screen 83.1 System start*

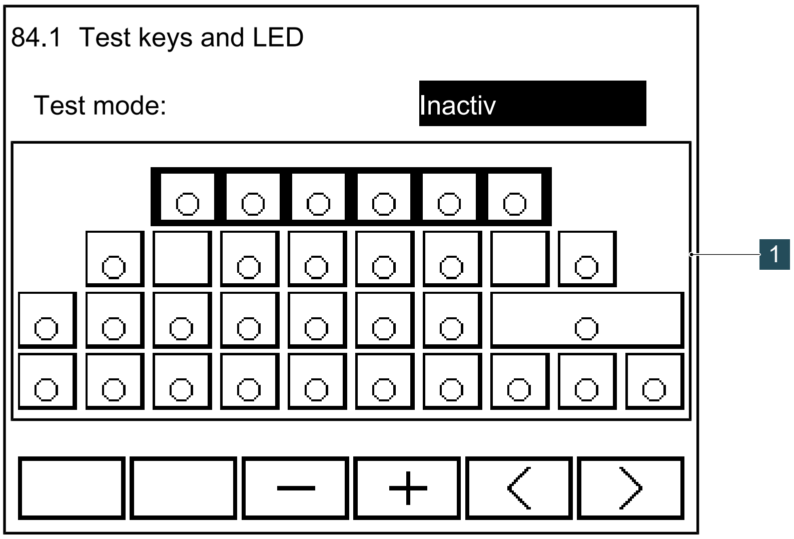
The data screen 83.1 is used to do the system test, for example, to set all data to default values or start a cold start. Only the approved personnel are permitted to do the test in the data screen 83.1.

| | |
|---|---|
| **Set default data:** | When the user selects **yes** , all the default values are set. |
| **Trigger cold start:** | The user can select **yes** to start a cold start. All data changes to the default values. |
| **Output MTBA:** | The user can select **yes** to download the MTBA data to a PC or a USB flash drive. |
| **Reset MTBA values:** | The user can select **yes** to delete the stored MTBA data. The system calculates the MTBA data again. |
| **Cleared on:** | Date and time when the MTBA data was reset. |

### 7.4.24 Menu 84

The menu **84 System test** has the following data screens:

### 7.4.24.1 Data Screen 84.1



84.1 Test keys and LED

Test mode: Inactiv

*Figure 108: Data screen 84.1 Test keys and LED*

The data screen 84.1 is used to do the test of the keys and LEDs.

**Test mode:** The user can tap the program key [Minus] or [Plus] to select **active** to start the test function.

When the user pushes a button of the operating unit, there are 2 possible results that follow:

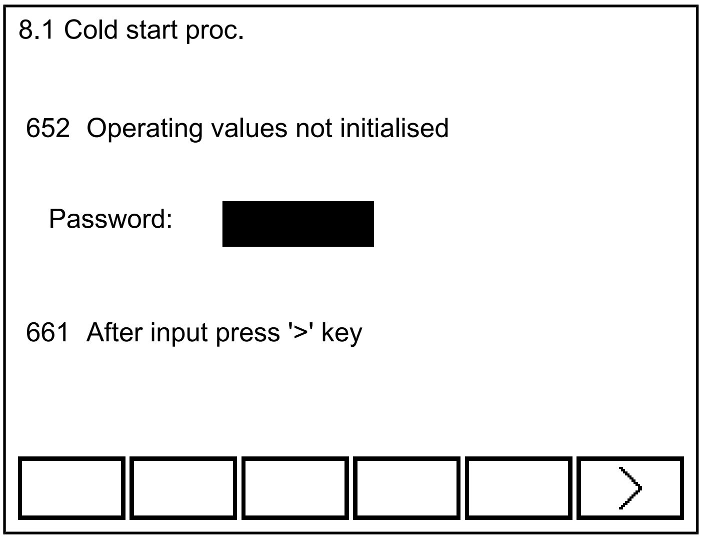
- If the related icon of the pushed button flashes in area 1, the button is in a good condition.
- If the related icon of the pushed button does not flash in area 1, the button does not function.

## 7.4.25 Data Screen 8.1

The data screen 8.1 shows the conditions that follow:

- The initial start-up
- The cold start
- After the software update

The user can use the [Numeric Key] to input the password if necessary. The user can refer to the instruction that shows on the bottom of the data screen to do the next step.



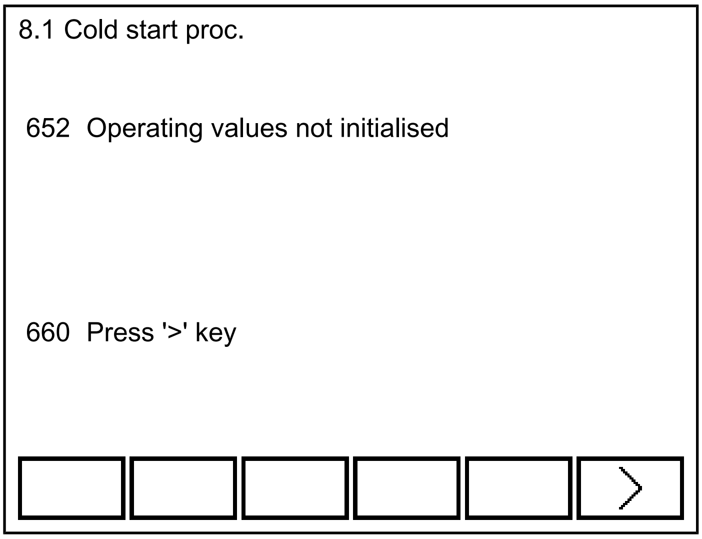
8.1 Cold start proc.

652 Operating values not initialised

Password:

661 After input press '>' key

*Figure 109: Data screen 8.1 page 1*



8.1 Cold start proc.

652 Operating values not initialised

660 Press '>' key

*Figure 110: Data screen 8.1 page 2*

## 7.5 Starting the Machine

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is prepared for the production.

1. Set the main switch to the position ON.

   ⇨ The power supply to the machine is started.

2. Put the material into the machine.
3. Push and hold the jog button to examine the correct flow of the material.
4. Push the start button.

**Result** The machine is started.

## 7.6 Setting Machine to the Starting Position

### WARNING

**Moving parts!**

Dangerous injuries because of the moving parts when you do the function test.

- ▶ Do **NOT** stay near the moving parts.
- ▶ Only the approved personnel are permitted to do the function test in the service mode.

The machine is put to the starting position to make sure that each component of the winding procedure is at the end position. Then the control unit can find component of the winding procedure.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Select the **Service mode** in the data screen 80.1.
2. **WARNING! Moving parts! Dangerous injuries because of the moving parts when you do the function test. → Do not stay near the moving parts. → Only the approved personnel are permitted to do the function test in the service mode.** If the machine is set to the starting position with a tube, open the data screen 82.1 to complete the test functions from step 3 to step 5.
3. Close the lap disks.
4. Lift the opener unit.
5. Lower the tension unit.
6. **WARNING! Moving parts! Dangerous injuries because of the mechanical movement that is controlled through data screen.** If the machine is set to the starting position without tube, enter the data screen 82.1 to complete the test function from step 7 to step 9.
7. Loosen the tension unit.
8. Lower the opener unit.
9. Open the lap disks.
10. Remove the lap from the lap-winding space.

**Result** The machine is put to the starting position.

## 7.7 Putting the Material

**WARNING**

**Turning drafting system rollers!**

Danger of crushing the hands between the drafting system rollers when the drafting system is in operation

▶ Do NOT touch the area between the drafting system rollers.

### Putting the Slivers into the Feed Creel

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position ON.

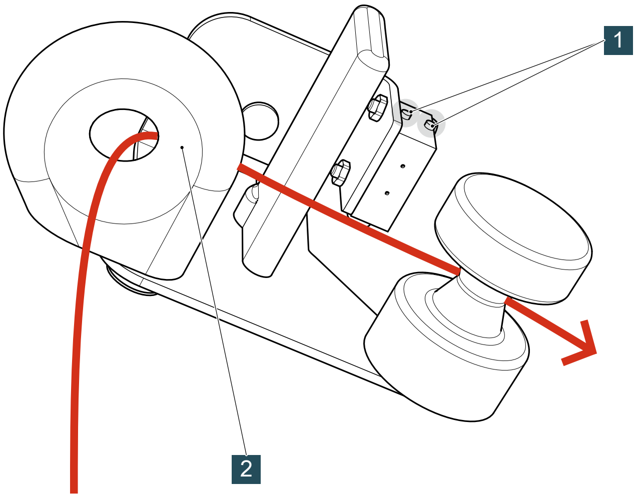


*Figure 111: Sliver guide of feed creel*

2. If 1 of the LEDs 1 is on, put the sliver from below through the ring 2.
3. If the LEDs are off, the sliver guide is not ready to guide the sliver.
4. Make sure that the same sliver goes through the guide rollers that have same color marks as the on creel.
5. Put the slivers into the sliver guide of the longitudinal section.

   ⇨ The slivers are put into the feed creel.

### Putting the Slivers into the Drafting System

**Prerequisites** Make sure that the criteria are obeyed:

✓ The slivers are put into the feed creel.

1. **WARNING! Drafting system rollers! Danger of crushing the hands between the drafting system rollers when the drafting system is in operation. → Do NOT touch the area between the drafting system rollers.** Open the drafting system hood 3 and loading arm 4 of the drafting system.

2. Pull the slivers into the feed.
3. Pull the slivers on the tensioning rod 5.

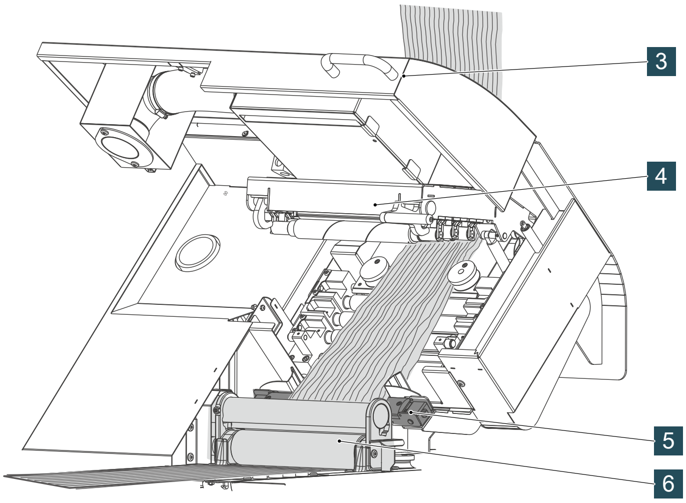


*Figure 112: The slivers through the drafting system*

4. To let the slivers go below the calendar cylinder 6, lift the calendar cylinder 6 at a necessary small height
5. Close the loading arm 4 of the drafting system.
6. Push and hold the jog button until the web moves to the front of the drafting system.
7. To let the web go below the calendar cylinder of the front drafting system, lift the calendar cylinder at a necessary small height.
8. Put the slivers into the front drafting system.
9. Put the web from the front drafting system on the top of the web from the rear drafting system carefully.

   ⇨ A batt is made.
10. Pull the batt into the lap head.

## Pulling the Batt into the Lap Head

1. Open the right side door of the lap head.
2. Pull out the suction wiper units 7 and 8 from the right side.

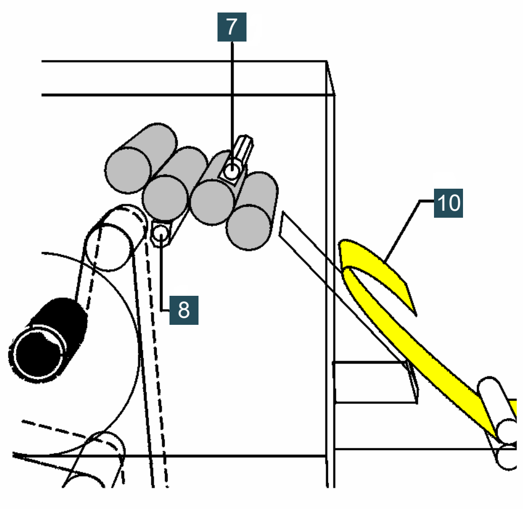


*Figure 113: The suction wiper unit at the calender cylinder*

3. Turn the rotary switch to open the infeed door.
4. Put the draw-in aid 9 between the roller A and the roller B.

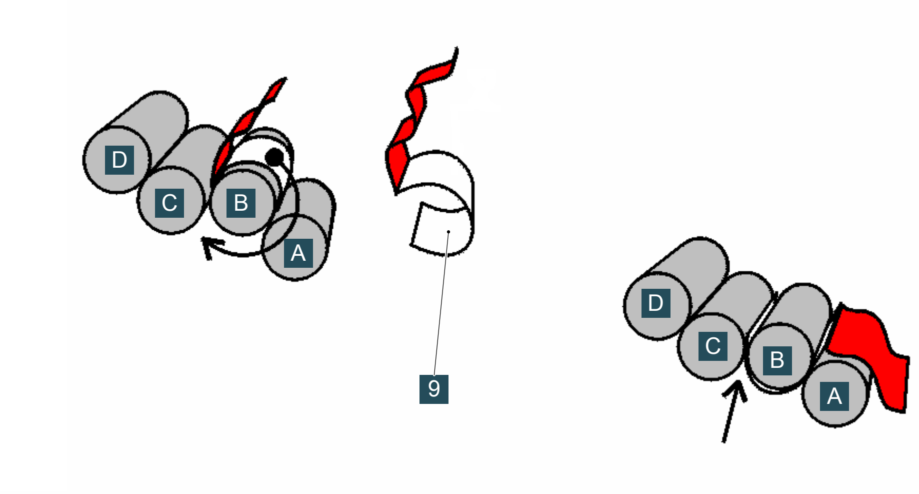


*Figure 114: The procedure of putting the draw-in aid through the rollers*

5. Attach the batt 10 to the red plush of the draw-in aid 9.

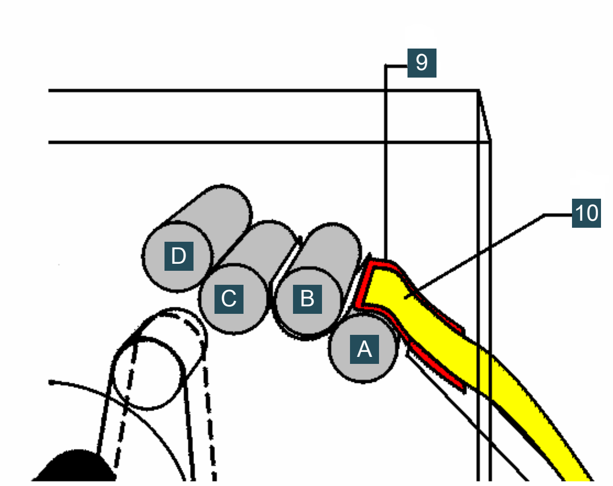


*Figure 115: The batt on the draw-in aid*

6. Close the right side door of the lap head and the infeed door.
7. Push the jog button to start the machine at low speed.
8. Monitor the position of the draw-in aid.
9. When the white plastic part of the draw-in aid 9 comes out from the roller B, release the jog button.

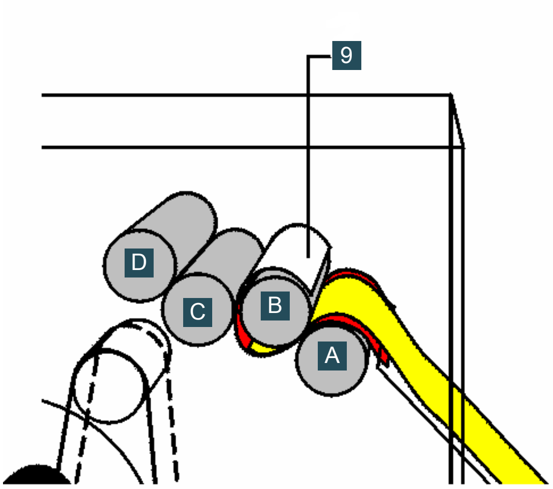


*Figure 116: Draw-in aid on the roller B*

10. Turn the rotary switch to open the infeed door.
11. Disconnect the white plastic part of the draw-in aid 9 from the roller B.

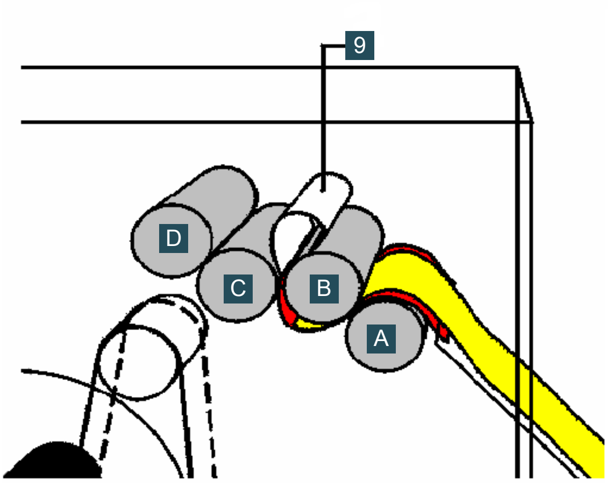


*Figure 117: Draw-in aid through roller B and roller C*

12. Close the infeed door.
13. Push the jog button to start the machine at low speed.
14. When the full draw-in aid 9 comes out from the roller B, release the jog button.
15. Remove the draw-in aid 9.
16. Put the batt on the roller C.
17. Push the jog button to start the machine at a low speed.
18. When the batt goes through the roller C and the roller D, release the jog button.
19. Open the right door of the lap head and pull the batt by hand to the tube 11.

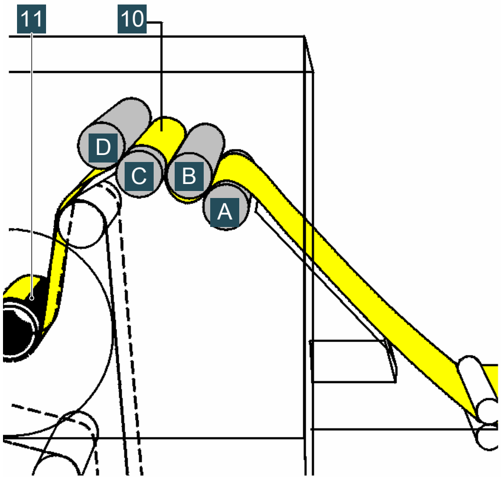


*Figure 118: Batt on the tube*

20. Close the right side door.

21. Push the jog button to move the batt forward.
    - ⇨ The lap belt around the tube moves the batt.
22. Install all suction wiper units.
23. Push the jog button to start the machine at a low speed.
24. Examine if the batt is correctly wound on the tube.

**Result** The batt is feed into the lap head.

## 7.8 Putting Laps on the Lap Trolley (for SERVOtrolley Version Only)

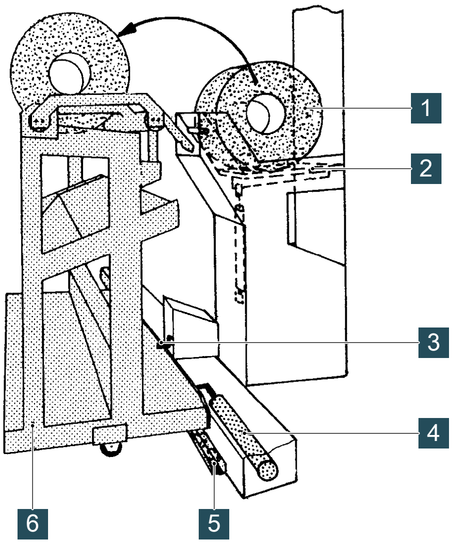


*Figure 119: Lap trolley*

The procedures of putting laps on the lap trolley are as follows:

- Move the lap trolley 6 smoothly on the guide rail 5 until the lap trolley locks into the latch 3.
- The tilting arm 2 lifts the ejected lap 1 and pushes the ejected lap 1 onto the lap trolley automatically.
- The pneumatic cylinder 4 moves the lap trolley 6 by 1 space of the lap automatically.
- The ejected lap is put on the lap trolley.

## 7.9 Setting and Adjusting the Machine

This section contains the information about the setup and the adjustment of the machine in accordance to different machine units.

## 7.9.1 Adjusting the Machine after a Material Change

The adjustments that follow are necessary to be examined when the raw material is changed.

### Adjustments of the Sliver Guide at the Creel

Adjust the sliver guide at the creel (*refer to* ▸ *239*).

### Adjustments of the Feed Width at Infeed of Drafting System

Adjust the sliver guide in front of the drafting system (*refer to* ▸ *235*).

### Adjustments of the Drafting System Distance

- Setting the drafting distance for the break draft.
  - Setting the break draft distance (*refer to* ▸ *230*).
  - Setting top rollers according to the draft distances (*refer to* ▸ *234*).
- Setting the drafting system distance for main draft.
  - Setting the main draft distance (*refer to* ▸ *228*).
  - Setting top rollers according to the draft distances (*refer to* ▸ *234*).

### Adjustments of the Total Draft

- Adjusting the total draft (*refer to* ▸ *223*).
- Adjusting the break draft (*refer to* ▸ *224*).

### Adjustments of the Winding Tension (V1)

- Examining the tension of the batt at the small lap diameter (*refer to* ▸ *164*).
- Setting the drive belt for lap compression (*refer to* ▸ *180*).

### Adjustments of the Winding Tension (V3)

- Selecting the value of the winding tension (V3).
- Setting the winding tension.
  - Adjusting winding tension (*refer to* ▸ *219*).
  - Examining the center situation of the belt (*refer to* ▸ *332*).
- Setting the web guides of the lap head (*refer to* ▸ *174*).

### Adjustments of the Output Draft (V4)

- Selecting the value of the output draft (V4) beyond drafting system.
- Adjusting the output draft (*refer to* ▸ *225*).

### Adjustments of the Web Guide on the Web Table

Adjusting the web guide on the web table (*refer to* ▸ *222*).

### Adjustments of the Feed Width at the Batt Infeed

Adjusting the web guide of the lap head (*refer to* ▸ *174*).

### Adjustments of the web guide of the Narrowing Device

- Setting the narrowing device (*refer to* ▸ *170*).
- Setting the web guide preceding the calender rolls (*refer to* ▸ *169*).

### Adjustments of the Web Guide of the Calender Unit

Setting the web guide of the lap head (*refer to* ▸ *174*).

### Adjustments of the Pneumatic Operating Pressure

The adjustments that follow are necessary to be adjusted.

- Setting the pressure of the tension lever roller (*refer to* ▸ *251*).
- Setting the calender load of the lap head (*refer to* ▸ *253*).
- Setting the pressure for the belt tensioner at the calender drive (*refer to* ▸ *252*).
- Setting the drafting system load (*refer to* ▸ *254*).
- Setting the pressure of lap disk (*refer to* ▸ *254*).

## 7.9.2 Lap Delivery

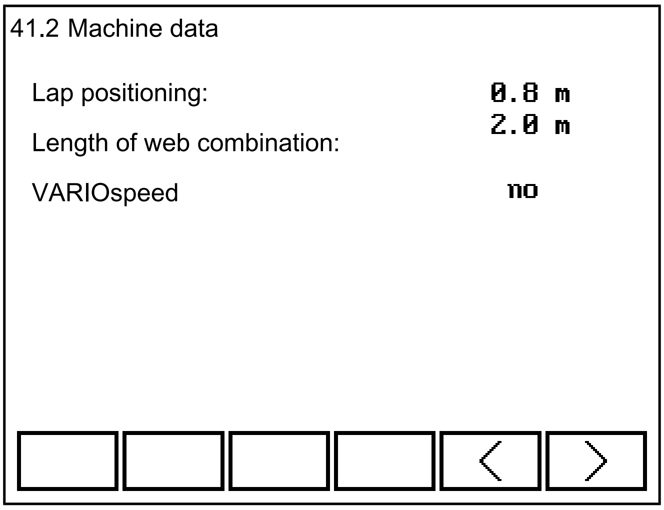
This section contains the information about the operation of the lap delivery.

### 7.9.2.1 Adjusting Lap Position

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the value of **Lap positioning:** in the data screen 41.2, adjust the detachment position 1 of the ejected lap.



41.2 Machine data

Lap positioning: 0.8 m

Length of web combination: 2.0 m

VARIOspeed no

Figure 120: Data Screen 41.2 Machine data

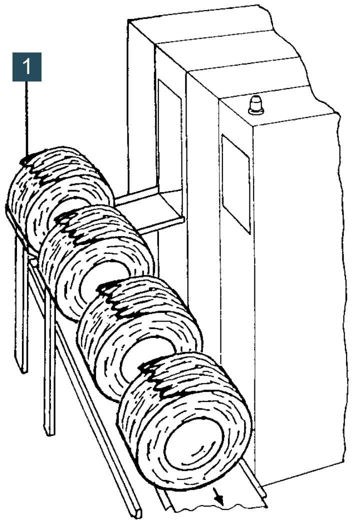


Figure 121: Detachment position

2. Make sure the batt does not separate from the lap during the transportation to the comber.
3. Make sure the detachment position 1 keeps in the area 3 during the lap transportation.

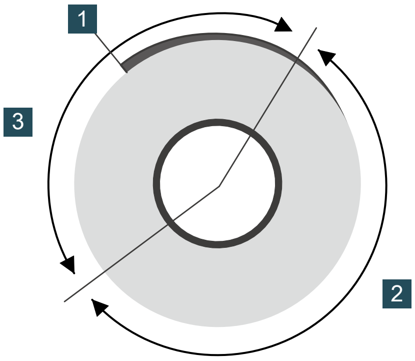


*Figure 122: Detachment position during lap transportation*

| | | | |
|---|---|---|---|
| 1 | Detachment position | 2 | The area 2 where the batt disconnects |
| 3 | The area 3 where the batt stays | | |

4. Make sure that less waste material is discarded during the piecing process.
5. Make sure that the detachment position 1 is in the area 4 when the lap is in the working position of the combing position.

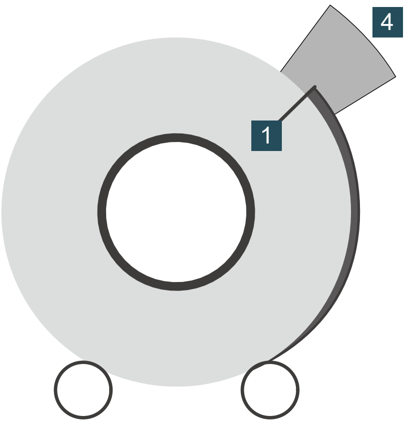


*Figure 123: Detachment position at comber*

| | | | |
|---|---|---|---|
| 1 | Detachment position | 4 | The position of piecing the batt |

**Result** The lap position is adjusted.

### 7.9.2.2 Adjusting the Fork Head of the Lift Cylinder

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Retract the piston rod 3.

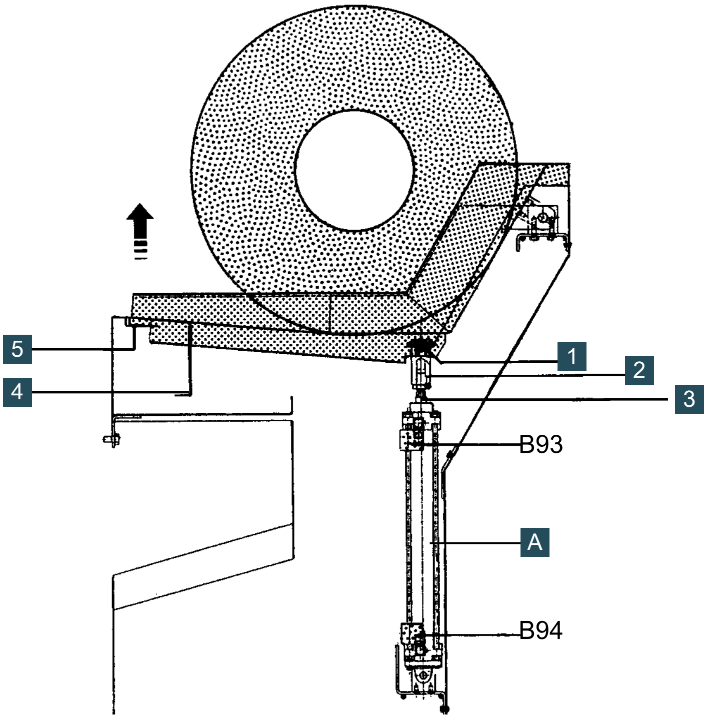


*Figure 124: Fork head of lift cylinder*

2. Put the tilting arm 4 on the bracket 5.
3. Adjust the fork head 2 to put the bolt 1 in the slot of the fork head 2.

**Result** The fork head of the lift cylinder is adjusted.

### 7.9.2.3 Adjusting the Drive for the Trolley Feed (only for SERVOtrolley)

This procedure contains the information about adjustment of the drive for the trolley feed.

At the pneumatic cylinders 2 and 3, the end position damping, retraction speed, and extension speeds must be set.

At the pneumatic cylinder for the slide 1, the pressure must be set. If this pneumatic cylinder is set, the pressure of the slide 1 is set. (SERVOtrolley mixed)

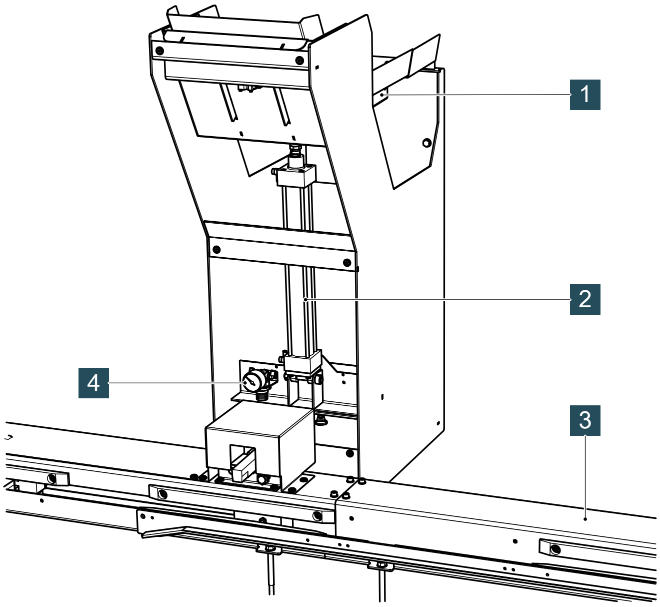


*Figure 125: Trolley feed*

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the pressure for the slide 1 at the controller 4.
2. Make sure that the value of the pressure is not more than 1 bar.
3. Set the end-position damping for the pneumatic cylinders 2 and 3 with the screws 6 and 7.
4. To adjust the extension duration to 5 seconds, adjust the throttle 5 to set the extension speed.

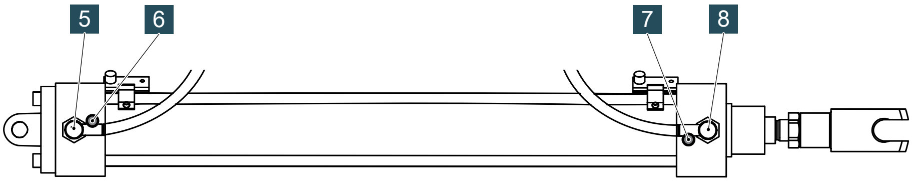


*Figure 126: Adjustment of pneumatic cylinder*

5. To adjust the retraction duration to 5 seconds, adjust the throttle 8 to set the retraction speed.

**Result** The drive for the trolley feed is adjusted.

### 7.9.2.4 Adjusting the Magnetic Limit Switches (for SERVOtrolleys)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Select the **Service mode** in data screen 80.1.

2. Move the lap trolley with the service function in data screen 82.1.

   ⇨ The locking lever lifts automatically.

3. Move the magnetic limit switch B191 1 in the direction of the arrow.

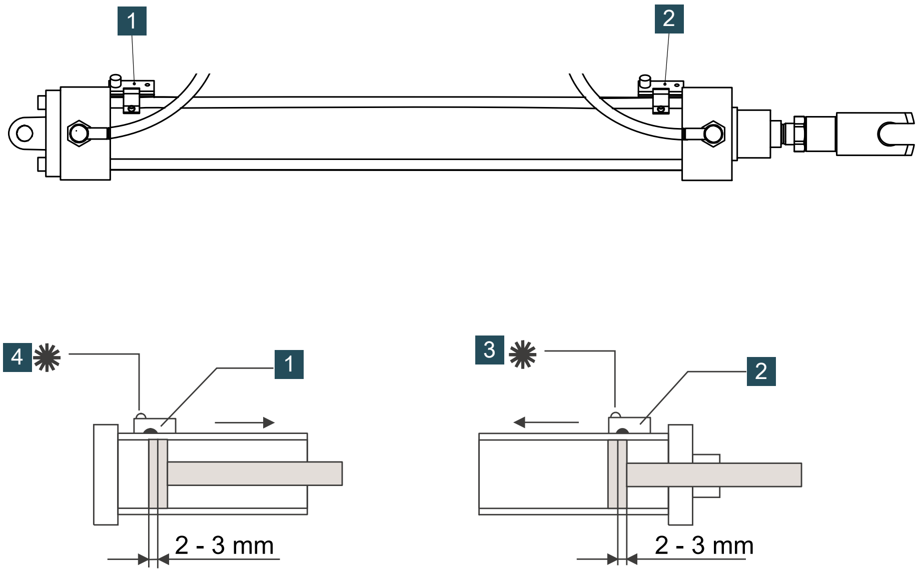


*Figure 127: Magnetic limit switches*

4. When the LED 4 is on, move the switch B191 1 2 to 3 mm more.
5. Install the limit switch B191.
6. Make sure that the limit switch B191 1 is on the cylinder.
7. Set all switches the same as the set limit switch B191.

**Result** The magnetic limit switches are adjusted.

### 7.9.2.5 Setting the Locking Lever (for SERVOtrolleys)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the fork head 1 until the locking lever aligns with the locking recess 4 of the lap trolley.

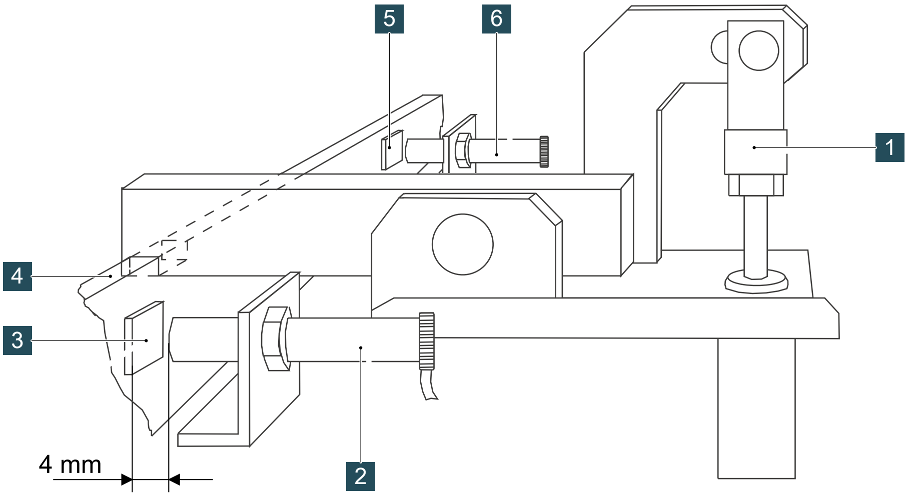


*Figure 128: Locking lever*

2. Adjust the proximity switch B196 2 until the distance between the proximity switch B196 2 and the plate 3 is 4 mm.
3. If the machine has proximity switch B197 6, adjust the proximity switch B197 6 until the distance between the proximity switch B197 6 and the plate 5 is 4 mm.

**Result** The locking lever is set.

### 7.9.2.6 Setting the Fork Head of the Feed Cylinder (for SERVOtrolleys)

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The drive of the trolley feed is set.

1. Loosen the nut 2.

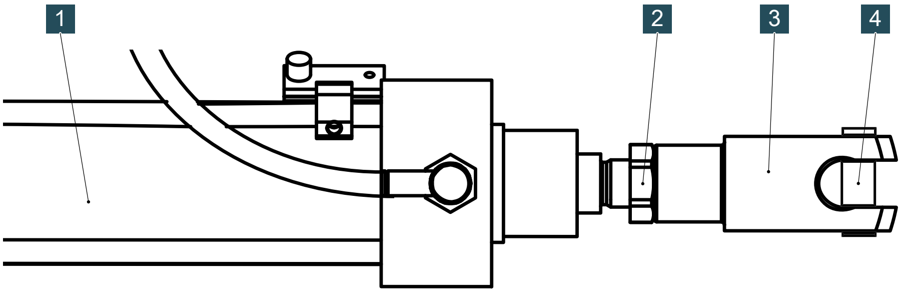


*Figure 129: Fork head*

2. Remove the bolts 4.
3. Adjust the position of the fork head 3 until the locking recess 6 aligned with the locking lever 5.

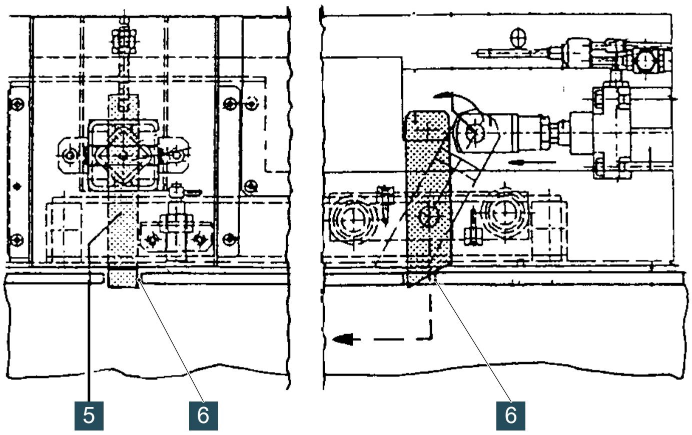


*Figure 130: Alignment of locking recess and locking lever*

4. Tighten the nuts 2.
5. Install the bolts 4.

**Result** The fork head of the feed cylinder is set.

### 7.9.2.7 Setting the Spring Elements on the Trolley

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Loosen the bolts 3.

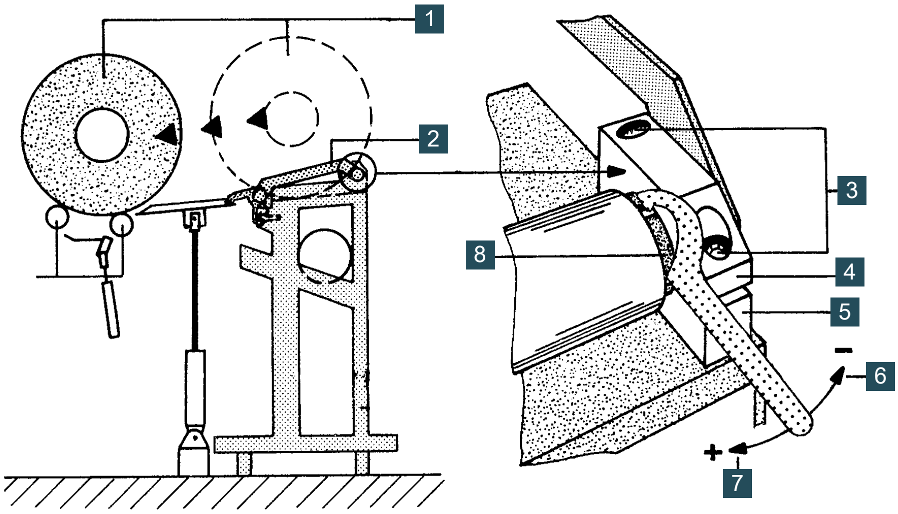


*Figure 131: Spring elements on the trolley*

2. To turn the spring elements 8 on the 2 sides to same position, use a hook wrench.

   ⇨ The counter-pressure is increased when spring elements 8 are turned in the direction 7.

⇨ The counter-pressure is decreased when the spring elements 8 are turned in the direction 6.

3. Tighten the bolts 3.
4. Make sure that the distance between the bottom bearing section 5 and the top bearing section 4 is the same on the 2 sides of the tilting arm 2.
5. Make sure that after the lap 1 rolled onto the trolley, the released tilting arm 2 engages in the lap roller automatically.

**Result** The spring elements on the trolley are set.

### 7.9.3 Lap Head

This section contains the information about the operation of the lap head.

#### 7.9.3.1 Adjusting the Air Gap at the Coupling

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Remove the holder 6.

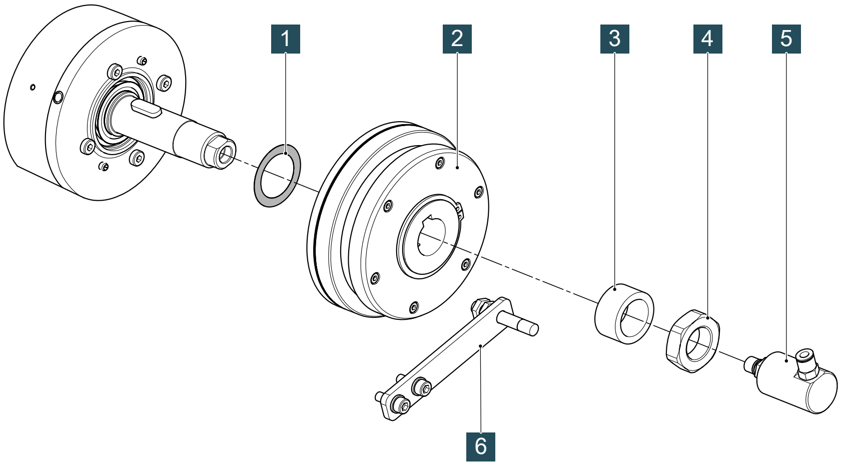


*Figure 132: Coupling*

2. Remove the rotary flange 5.
3. Remove the nut 4.
4. Remove the spacer tube 3.
5. Remove the coupling 2.
6. Adjust the washers 1.
7. Install the coupling 2.
8. Install all the parts.
9. Set the proximity switch of the coupling.
10. Do not to loosen the screws 7 and 8.

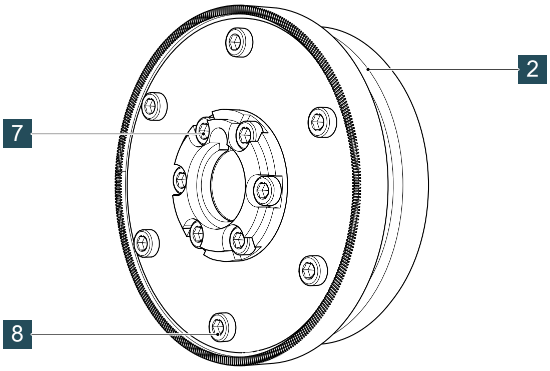


*Figure 133: Screws at coupling*

11. Examine the air gap at the coupling when the coupling is closed.

**Result** The air gap at the coupling is adjusted.

### 7.9.3.2 Adjusting the Armature Disk to the Center Position

This procedure contains information about the adjustment of the armature disk to the center position.

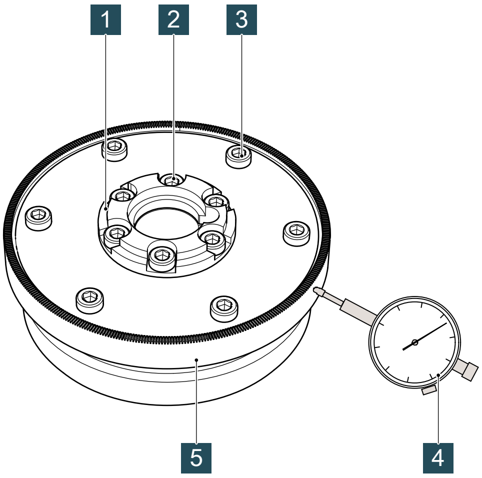


*Figure 134: Armature disk*

Only in the condition that the screws 2 and 3 are loosened, it is necessary to adjust the armature disc 5 to the center position.

1. Loosen the screws 2.
2. Push the coupling onto the shaft to make sure that the tension flange 1 is aligned with the bore and the keyway.
3. Tighten the screws 2.
4. Attach the screws 2 with adhesive material.

   ⇨ The tension flange is put to the center position.

5. Put the coupling on an applicable position to turn the armature disk easily.
6. Loosen the screws 3.
7. Tighten the screws 3 but not too tight.
8. Attach the dial check gauge 4 to the armature disk.
9. Adjust the armature disk 5 to make sure that the tolerance is not more than 0.05 mm.
10. Tighten the screws 3.
11. Apply the glue to the screws 3.

**Result** The armature disk is adjusted to the center position.

### 7.9.3.3 Adjusting and Examining the Proximity Switch of the Coupling

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Select the **Service mode** in the data screen 80.1.
2. Open the coupling in the data screen 82.1.
3. Adjust the nut 1 of the proximity switch 2 to set the distance D at 1.5 mm.

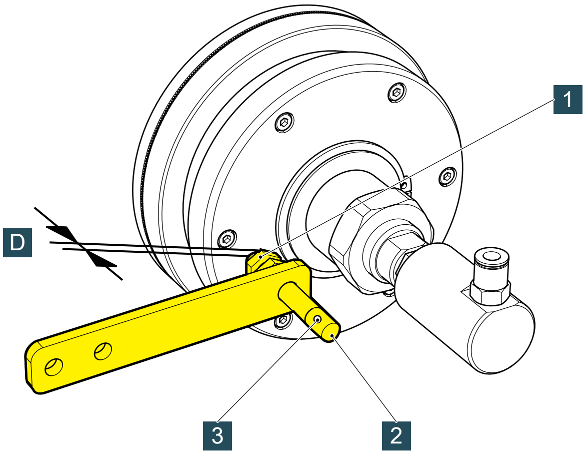


*Figure 135: The sensor of the coupling*

4. Examine if the LED 3 is on.
5. Close the coupling in the data screen 82.1.
6. Examine if the LED 3 is off.

**Result** The coupling is adjusted and examined.

### 7.9.3.4 Setting the Motor Holder

## CAUTION

**Hot motor!**

Injuries to the hands because of the hot motor surface

- ▶ Do **not** touch the hot motor.
- ▶ Wait until the temperature of the motor decreases.

The purpose of this procedure is to make sure that the motor is not pulled down because of the belt tension.

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The main switch is set to the position OFF and padlocked.

1. **CAUTION! Hot motor! Injuries to the hands because of the hot motor surface**. Loosen the belt.
2. Loosen the counter-nuts 2.

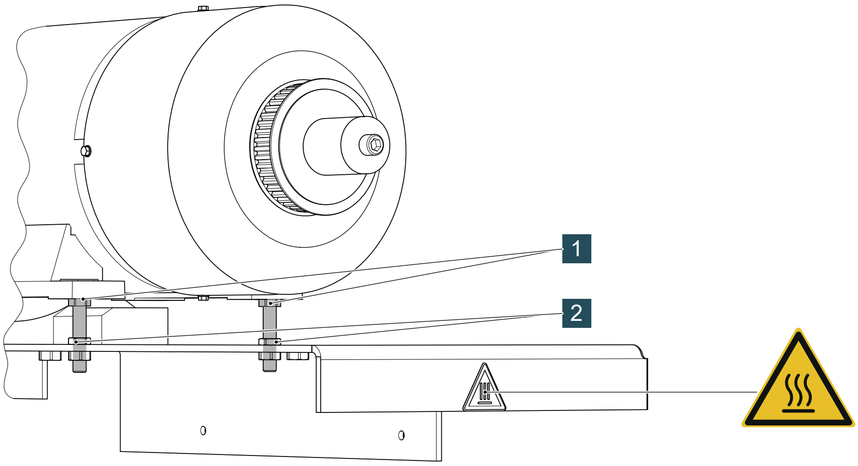


*Figure 136: Motor holder*

3. Adjust the retaining bolts 1.
4. Adjust the counter-nuts 2 to tighten the retaining bolts 1.
5. Tighten the belt.

**Result** The motor holder is set.

### 7.9.3.5 Tightening the Double Toothed Belt

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The motor holder is set.

1. Loosen the screws 3 and 5.

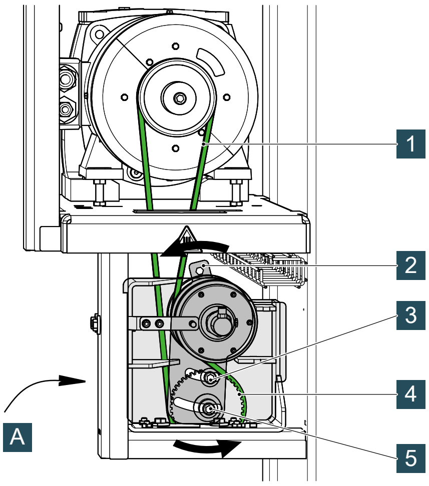


*Figure 137: Double toothed belt*

2. Install the belt 1.
3. Put a hexagonal key on the belt tension lever 2.
4. Put a hexagonal key on the screw 5.
5. Turn the belt tension lever with 2 hexagonal keys in the direction of arrow A.
   ⇨ The tension roller 4 tightens the double toothed belt 1.
6. Tighten the tension pulley to make sure that the pressure of the tension roller 4 is 8 kg.
7. Tighten the screws 3 and 5.

**Result** The double toothed belt is tightened.

#### 7.9.3.6 Setting the Double Toothed Belt in Operation

1. Monitor the double toothed belt in operation.
2. Put a 6 mm hexagonal key into the rocker bolt 4 from the side A.

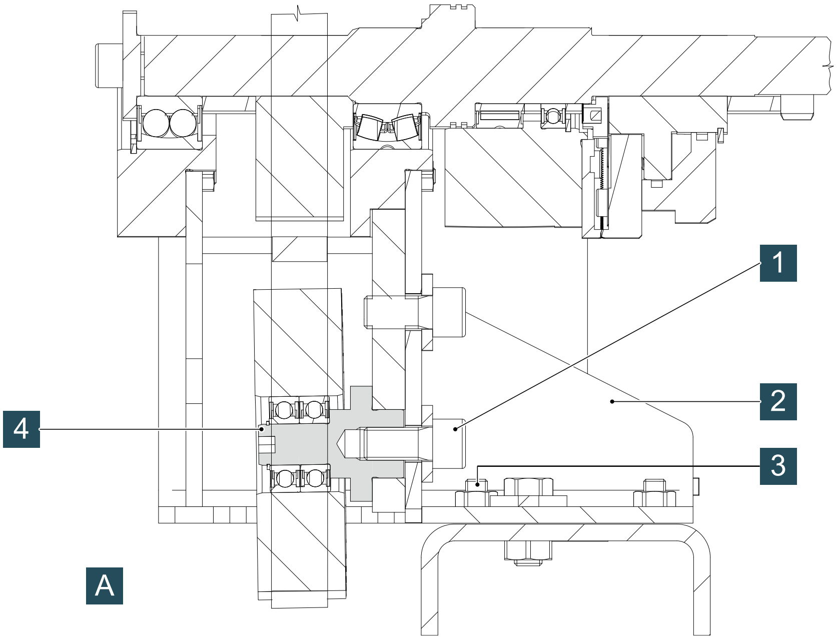


*Figure 138: Adjustment of the belt*

3. Loosen the screw 1.
4. Adjust the rocker bolt 4 to move the belt to the center position.
5. Tighten the screw 1.
6. If the double toothed belt is still not moved to the correct center position, adjust the adjusting screws 3 to change the inclination of the bracket 2.
7. Do the steps from 1 to 6 again until the double toothed belt moves to the correct center position.

**Result** The working path of the double toothed belt is set.

### 7.9.3.7 Examining the Tension of the Batt at the Small Lap Diameter

This procedure is used for the small lap diameters.

## NOTICE

**Stuff could fall into the machine!**

The machine can be broken because of something falls into the machine.

- ▶ Do NOT go into the opening area.
- ▶ Make sure that nothing falls into the machine.
- ▶ Make sure that your breast pocket is empty.

1. Select the **Automatic mode** in the data screen 80.1.
2. Make sure that the ladder 2 is stable.

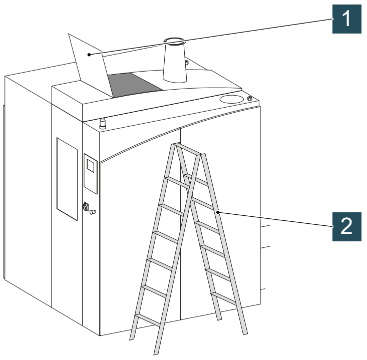


*Figure 139: Ladder adjacent to the machine*

3. Open the cover 1.
4. Examine the status of the lap with a flashlight.
5. If the batt is tightened without blister like the status A, decrease the draft until a blister form.

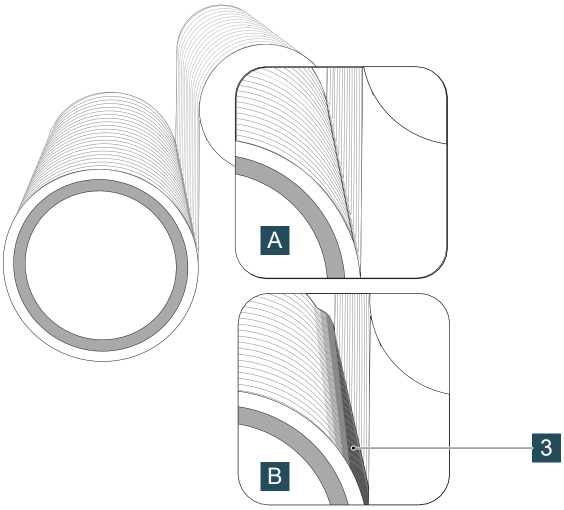


*Figure 140: Blister of the small lap*

| | | | |
|---|---|---|---|
| A | No blister – the batt is tightened. | B | Blister at the small lap – the batt is not tightened sufficiently. |

6. Increase the draft until the blister goes out of view (*refer to ▸ 180*).
7. If the batt has blister and the batt is not tightened sufficiently like the status B, increase the draft until the blister 3 goes out of view (*refer to ▸ 180*).

**Result** The tension of the batt at the small lap diameter is examined.

### 7.9.3.8 Adjusting the Sensors for the Calender Load

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Adjust the proximity switch to make sure the proximity switch is in a good condition.
2. Start the machine with material.
3. Push the stop button to stop the machine.
4. Push the jog button to apply load to the calender rollers.
5. Loosen the bolts 2 and the lock nuts 1.

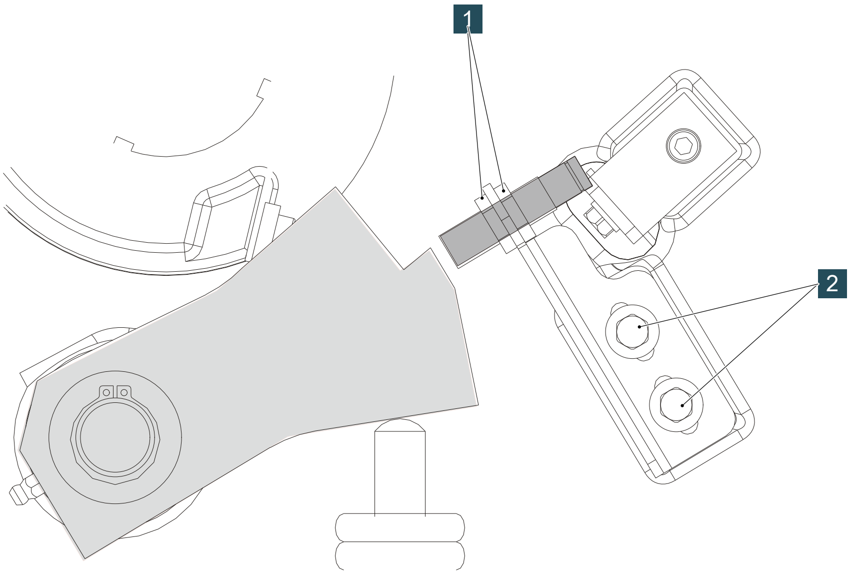


*Figure 141: Adjustment of distances of sensors*

6. Set the distance S to 2 mm on the 2 sides.

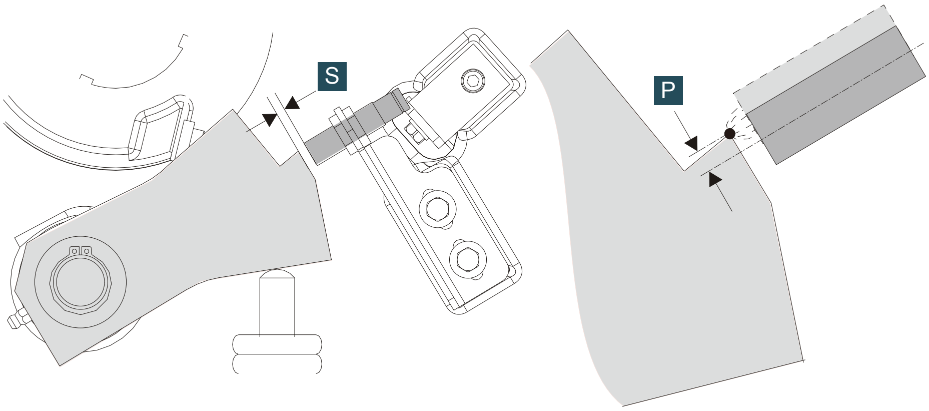


*Figure 142: Distance between sensor and cylinder*

7. Set the distance P to 1.5 mm on the 2 sides.
8. Tighten the bolts 2 and the nuts 1.

**Result** The sensors for the calender load are set.

### 7.9.3.9 Introduction of Throttles for Calender Load

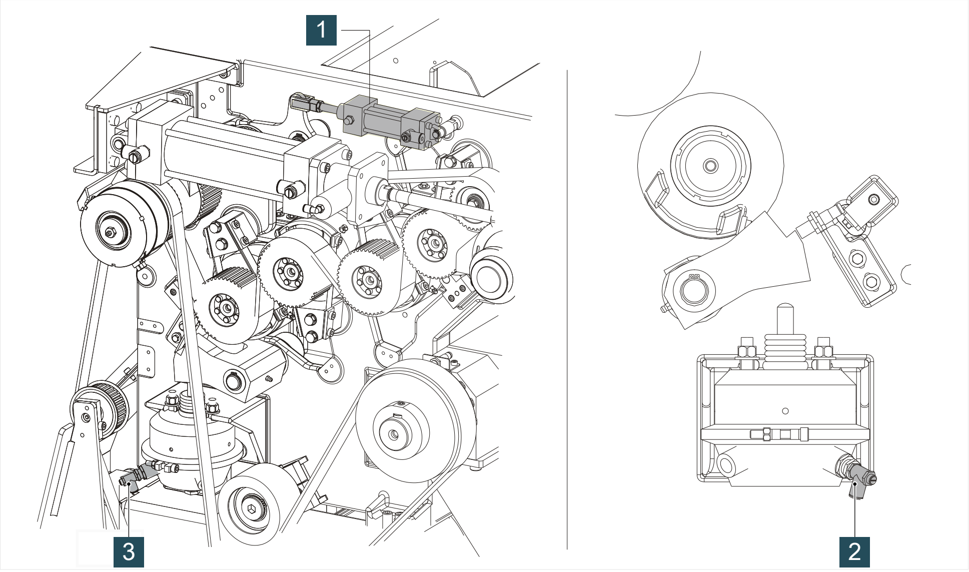


*Figure 143: Adjustment of throttles for calender load*

| | | | |
|---|---|---|---|
| 1 | Throttle valve for the belt tensioner | 2 | Intake throttle valve at the left side of the machine |
| 3 | Intake throttle valve at the right side of the machine | | |

The throttles 2 and 3 control the closing speed of the calender rollers. The throttle valve for the belt tensioner 1 is installed on the pneumatic unit. The throttles are adjusted to close the calender rollers on the 2 sides at the same time. Only after these calender rollers close on 2 sides at the same time, the double toothed belt is ready to be tightened.

The sequences of the movements are as follows:

- Solenoid valve receives the controller pulse and controls all 3 cylinders.
- The calender rollers close slowly and immediately on the 2 sides.
- The belt tensioner operates after an interval of 1 second for the calender load.

### 7.9.3.10 Examining the Calender Roller Wipers

**Prerequisites** Make sure that the criteria are obeyed:

✓ The main switch is set to the position OFF and padlocked.

1. Illuminate a flashlight at the left side.
2. Examine if the light from the flashlight is seen between the wiper and the calender roller.
3. If no light is seen between the wiper and the calender roller, the tube clamping is set correctly.

4. If the wiper 1 is set against the calender roller at the point A or point B, adjust the wiper parallel to the calender roller.

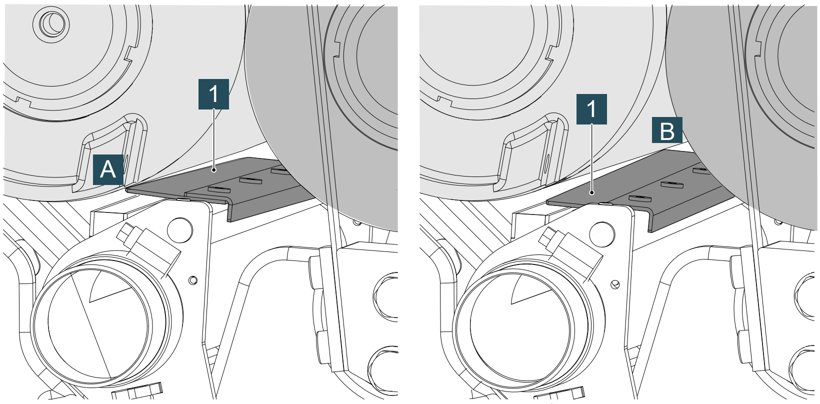


*Figure 144: Examination of the wiper blade*

**Result** The wiper blade of the calender roller is examined.

### 7.9.3.11 Adjusting the Calender Roller Wipers

**Prerequisites** Make sure that the criteria are obeyed:

✓ The main switch is set to the position OFF and padlocked.

1. Loosen the screws 3.

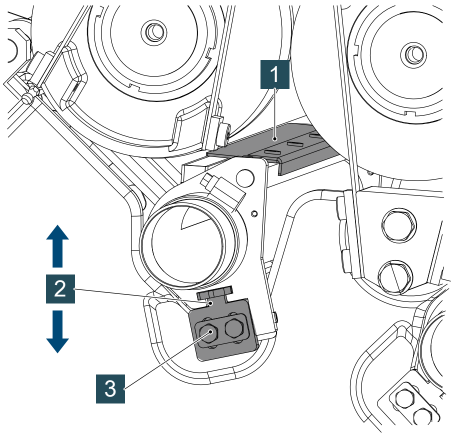


*Figure 145: Adjustment of the wiper blade*

2. Move the pins 2 in the direction of the arrow to adjust the wiper blade 1 parallel to the calender roller.
3. Tighten the screws 1.

**Result** The wiper blade of the calender roller is adjusted.

### 7.9.3.12 The Description of the Web Narrowing

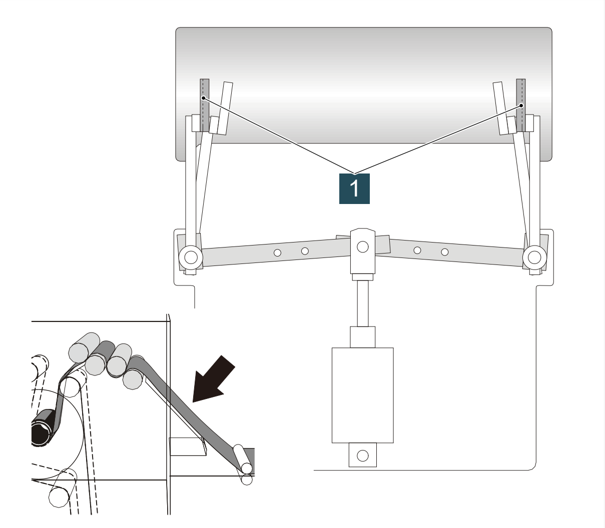


*Figure 146: Web narrowing*

The web should be collected prior to lap change. The web narrowing is necessary for the automatic piecing process at the comber.

The procedures of the web narrowing operation are as follows:

- The moving web guides **1** are open during the usual winding procedure.
- A short time before the lap change, the web guides **1** turn in.
- The width of the batt decreases for the last meters of the lap.

### 7.9.3.13 Adjusting Web Guides for Web Narrowing in the Open Position

## WARNING

**Moving parts!**

Dangerous injuries because of the moving parts when you do the function test.

- ▶ Do **NOT** stay near the moving parts.
- ▶ Only the approved personnel are permitted to do the function test in the service mode.

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The web guides for web narrowing are adjusted in the closed position.
- ✓ The machine is at a standstill.

1. Select the **Service mode** in the data screen 80.1.
2. **WARNING! Moving parts! Dangerous injuries because of the mechanical movements of the parts when you do the function test.** Extend the piston through the test function in the data screen 82.1.

3. Make a mark for the center line of the calender rollers 2.

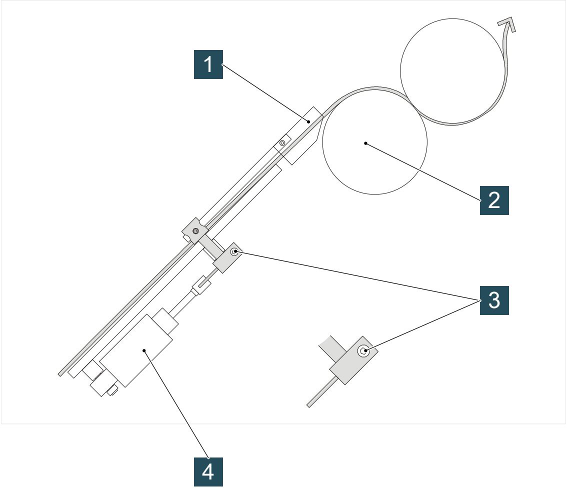


*Figure 147: Adjustment of web guides for web narrowing in open position*

4. Loosen the screws 3.
5. Set the distance B between the web guide 1 to 149.5 mm ± 0.5 mm.

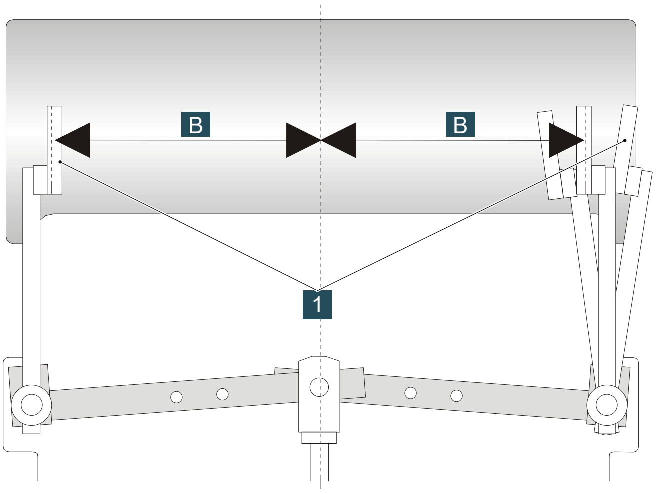


*Figure 148: Web Guides for web narrowing*

6. Tighten the screws 3.

**Result** The web guides for web narrowing in the open position are adjusted.

### 7.9.3.14 Adjusting Web Guide for Web Narrowing in the Closed Position

When the cylinder is put into different holes, the web narrowing dimension is changed.

1. Put the fork head 4 into the hole 3 to get the web narrowing A (hole 3 is the recommended position).

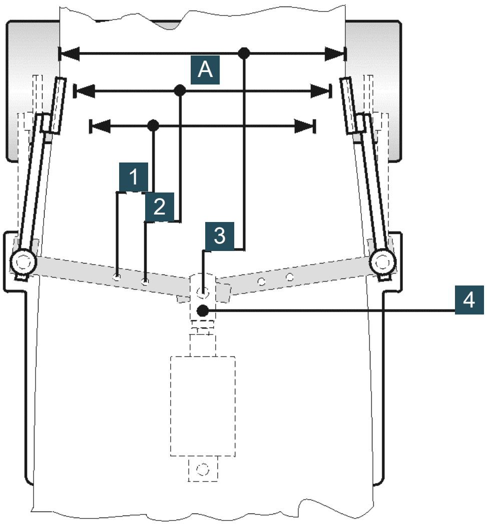


*Figure 149: Adjustment of the web guide in closed position*

2. If it is necessary to make a narrower web, put the fork head 4 into the holes 1 or 2.

**Result** The web guides for web narrowing in the closed position are adjusted.

### 7.9.3.15 Adjusting the Speed of the Web Guides for Web Narrowing

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Adjust the throttle valves 1 to make sure that the piston 2 move slowly into the end position.

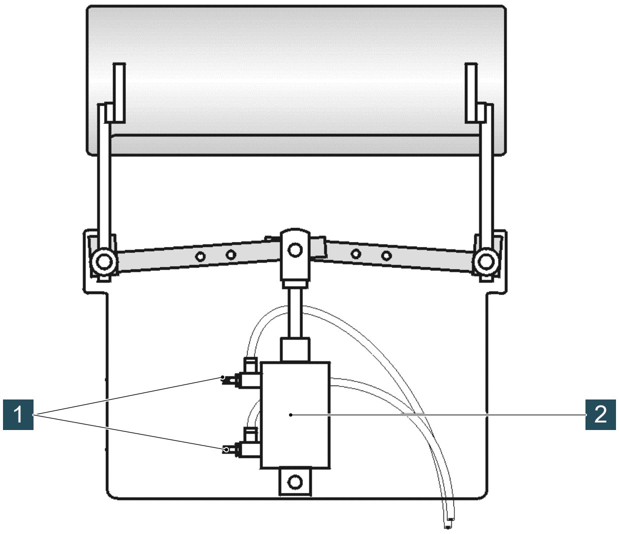


*Figure 150: Adjustment of the speed of the web guides for web narrowing*

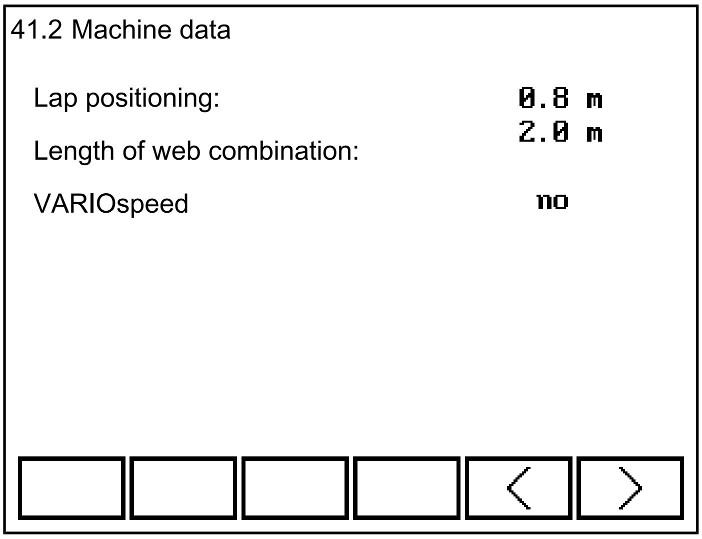
**Result** The speed of the web guides for web narrowing is adjusted.

### 7.9.3.16 Adjusting the Length of the Web Narrowing

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Select the **Service mode** in data screen 80.1.
2. Set the value of the **Length of web combination:** to 3 m (the nominal value) in the data screen 41.2.


41.2 Machine data

Lap positioning: 0.8 m

Length of web combination: 2.0 m

VARIOspeed no

Figure 151: Data screen 41.2 Machine data

**Result** The length of the web narrowing is adjusted.

### 7.9.3.17 Procedure to Examine the Batt Cross-Section

The items to analyze the batt cross-section are as follows:

- The hardness of the lap is equal for the full width.
- The surface of the end faces are as alike as possible..
- The path of the batt is stable.

### Samples of the batt cross-section

The 3 samples of the batt cross-section are as follows:

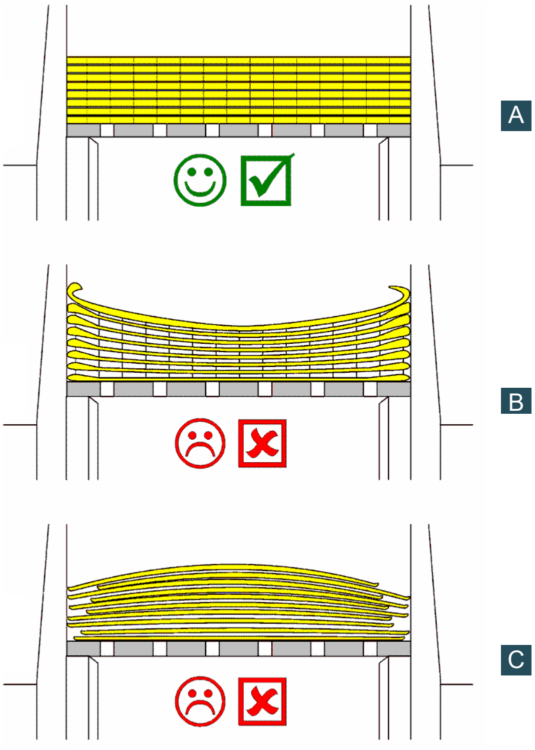


*Figure 152: The batt cross-section*

**Sample A** The sample A shows:

- The homogeneous batt cross-section.
- No turned over batt edges.
- Almost same end faces.

If the batt cross-section is like the sample A, the sliver and the web guides are in a good condition.

**Sample B** The sample B shows:

- The batt is too wide.
- The fibers at the edges are more than the fibers in the center.

If the batt cross-section is like the sample B, the procedures to adjust the machine are as follows:

- Set the sliver guides of the longitudinal section closer (*refer to ▸ 235*).
- Adapt the web guides on the web table to the new web width (*refer to ▸ 237*).
- Set the guide elements of the lap head (*refer to ▸ 174*).

**Sample C** The sample C shows:

- The batt is too narrow.
- The fibers at the edges are fewer than the fibers in the center.

If the batt cross-section is like the sample C, the procedures to adjust the machine are as follows:

– Set the sliver guides of the longitudinal section further apart (*refer to* ▸ *235*).

– Adapt the web guides on the web table to the new web width (*refer to* ▸ *237*).

– Set the guide elements of the lap head (*refer to* ▸ *174*).

### 7.9.3.18 Adjusting the Web Guides of the Lap Head

The web guides have an effect on the transverse supply of the fibrous mass. An equal transverse supply is an important condition to make a high-quality lap.

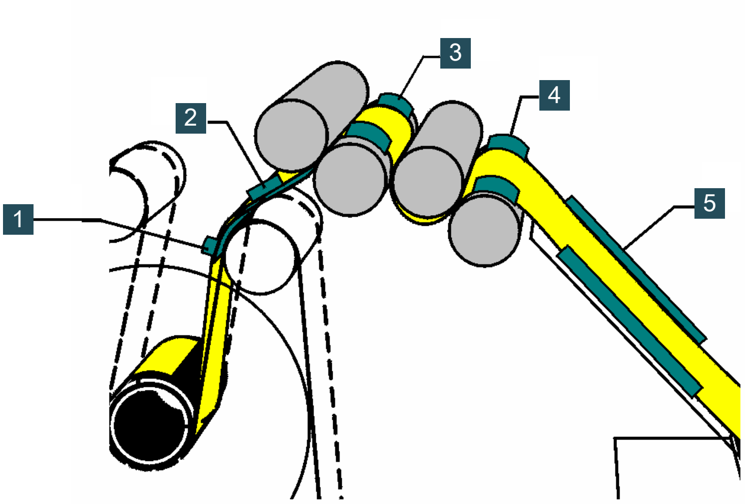


*Figure 153: Adjustment of the web guides of the lap head*

| Web Guide | Range |
|---|---|
| Web guides 1 and 2 | 258 mm - 298 mm |
| Web guides 3 and 4 | 260 mm – 280 mm |
| Web guide 5 | 280 mm – 290 mm |

*Table 43:* Range of the distances between the web guides

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Adjust the distances between the web guides in accordance with the table **Range of the distances between the web guides**.
4. Set the distance X between the guide plate of the web guide 3 and the calender roller to 0.2 mm.

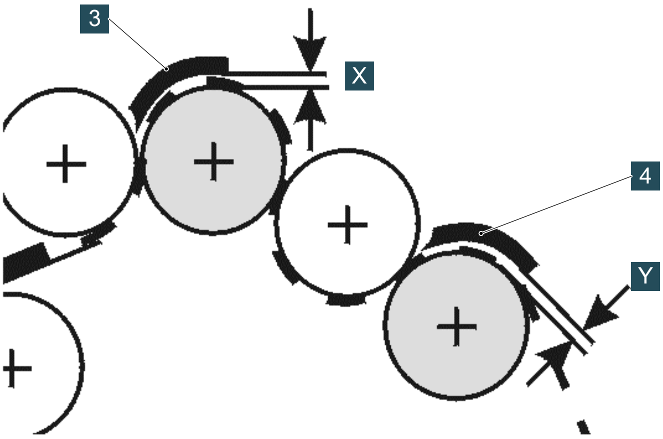


*Figure 154: Distance between the guide plate and the calender roller*

5. Set the distance Y between the guide plate of the web guide 4 and the calender roller to 0.2 mm.
6. Make sure that the web guides touch the sides of the batt.

**Result** The web guides of the lap head are adjusted.

### 7.9.3.19 Adjusting the Speed of the Detaching Flap

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Adjust the throttle 2 at the pneumatic unit to control the lifting speed of the detaching flap 1.

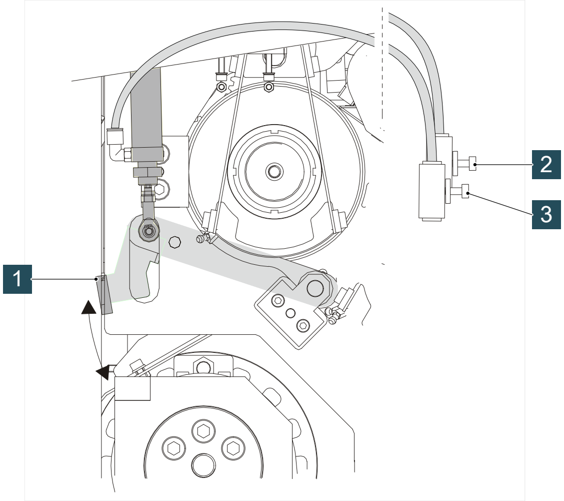


*Figure 155: Adjustment of the speed of the detaching flap*

2. Adjust the throttle 3 at the pneumatic unit to control the lowering speed of the detaching flap 1.
3. Make sure that the detaching flap 1 moves slowly and immediately.

**Result** The speed of the detaching flap is adjusted.

### 7.9.3.20 Setting the Sensor for the Lap Winding Area

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Put a tool 6 such as a 5 mm hexagonal key (the tool simulates a sliver that goes through pipe 7) on the edge 5 and the pipe 7 to examine the switching point of the sensor.

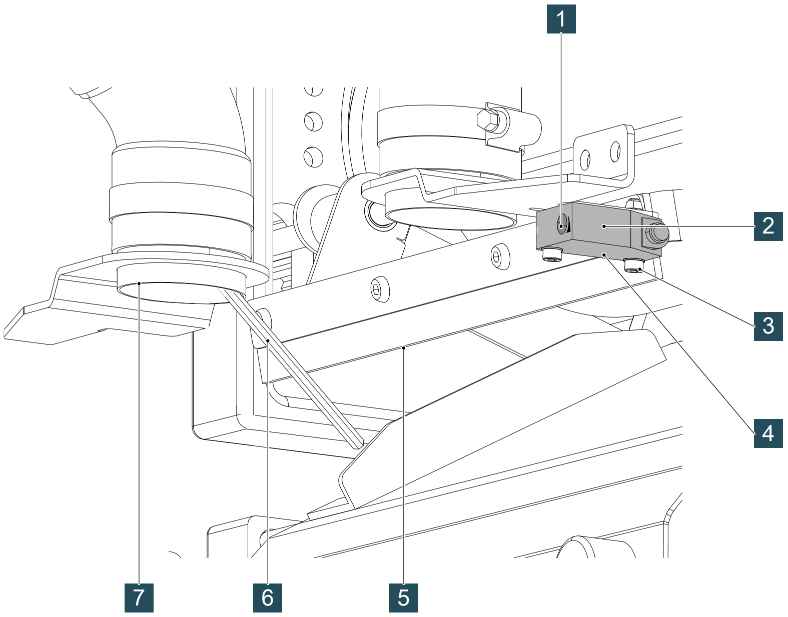


*Figure 156: Adjustment of the sensor of the lap winding area*

⇨ The LED 3 is on.

2. Remove the tool 6.

⇨ The LED 3 is off.

⇨ The switching point of the sensor is examined.

3. Adjust the light barrier 4 to align the light beam on the tool 6.
4. Fix the light barrier 4 with the screws 3.
5. Turn the potentiometer 1 clockwise to increase the scanning width or turn the potentiometer 1 counterclockwise to decrease the scanning width.

**Result** The sensor for the lap winding area is set.

### 7.9.3.21 Adjusting the Tube Clamping of Lap Disks

The 2 lap disks are used to hold the tube to make the lap. The lap disks open and close pneumatically.

## WARNING

**Moving parts!**

Dangerous injuries because of the moving parts when you do the function test.

- ▶ Do **NOT** stay near the moving parts.
- ▶ Only the approved personnel are permitted to do the function test in the service mode.

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ Machine is at a standstill.
- ✓ There is no tube in the lap disk.

1. Select the **Service mode** in the data screen 80.1.
2. **WARNING! Moving parts! Dangerous injuries because of the mechanical movements of the parts when you do the function test.** Close the lap disks through the service function in the data screen 82.1.
3. Examine if the distance X is in the range of 298 mm to 299 mm.

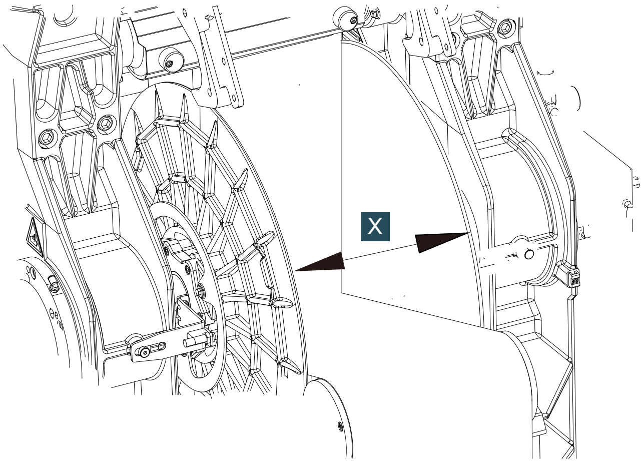


*Figure 157: Distance between the lap disks.*

⇨ If the distance X is out of the range from 298 mm to 299 mm, adjust the number of the washers 1 to adjust the distance X.

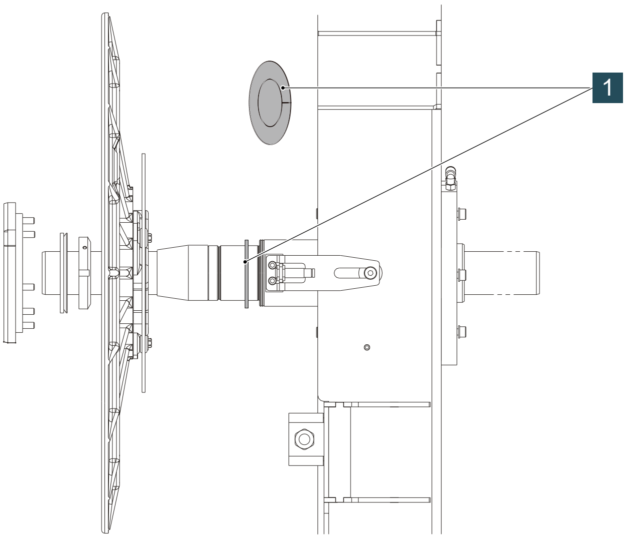


*Figure 158: Adjustment of the tube clamping*

**Result** The tube clamping of the lap disks are adjusted.

### 7.9.3.22 Adjusting the Sensor of the Lap Disk

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.

1. Select the **Service mode** in data screen 80.1.
2. Put the tube between the lap disks through the test function in the data screen 82.1.
3. Open and close the lap disk through the test function in the data screen 82.1 to make sure that the proximity switch 1 works correctly.

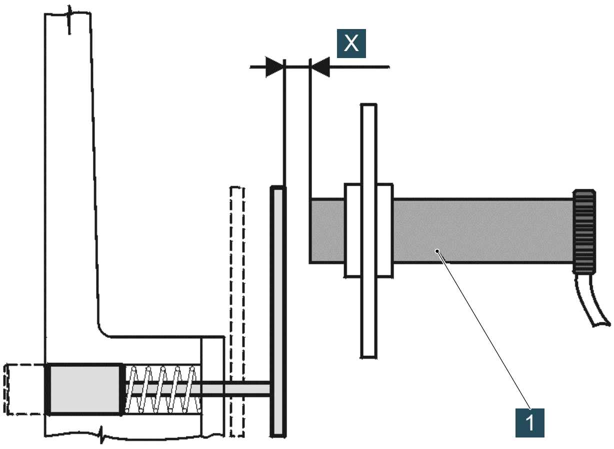


*Figure 159: Adjustment of the proximity switch of the lap disk*

4. When the lap disk is closed with a tube inside, adjust the position of the proximity switch 1 to set the distance X in the range of 1 mm to 2 mm.

5. Examine the work condition of the proximity switch 1.
   - ⇨ If the LED of the proximity switch 1 is on when the lap disk is closed with a tube inside, the proximity switch 1 works correctly.
   - ⇨ If the LED of the proximity switch 1 is off when the lap disk is open, the proximity switch 1 works correctly.
6. If the proximity switch 1 operates incorrectly, readjust the proximity switch.

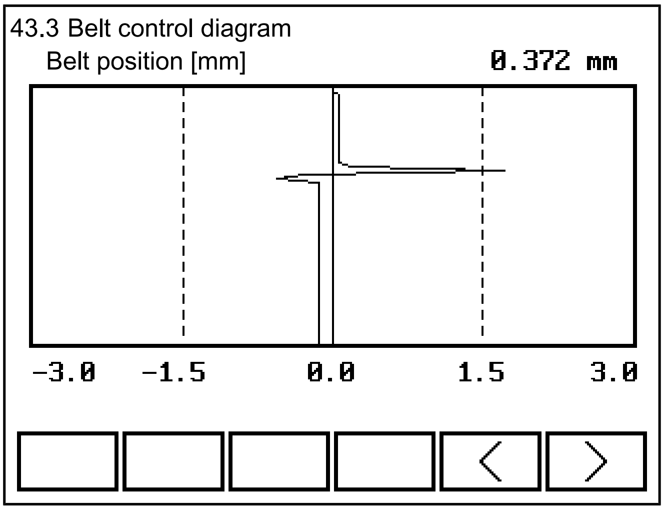
**Result** The sensor of the lap disks are adjusted.

### 7.9.3.23 Adjusting the Belt during the Lap Formation Procedure

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is in operation.

1. Open the data screen 43.3.



43.3 Belt control diagram

Belt position [mm] 0.372 mm

*Figure 160: Data screen 43.3 Belt control diagram*

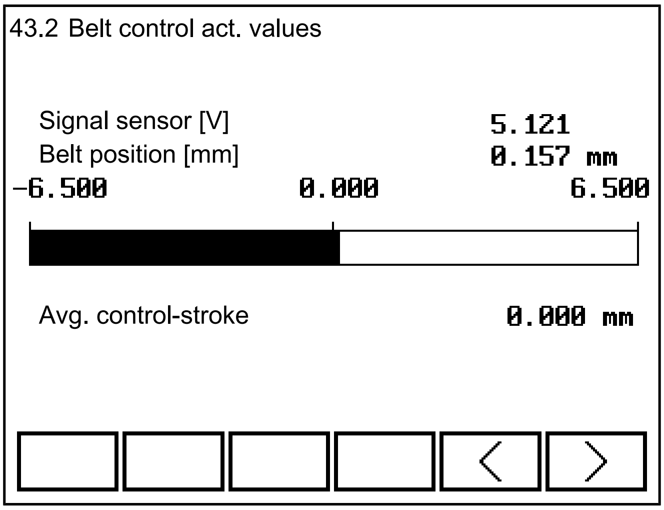
2. Monitor the curve in the data screen 43.3.
3. If the curve changes to the right side and to the left side frequently, especially after a lap change (the lap belt does not move smoothly), set the position plates of the lap belt.
4. If the curve changes to the right side or to the left side during the lap formation procedure, set the target position for the lap belt.
5. If the edges of the lap belt touch the lap disk and the curve changes to the right side and to the left side frequently, adjust the belt control mechanism.

### 7.9.3.24 Adjusting the Belt Control Mechanism

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is in operation.
- ✓ 1 lap is completed.

1. Stop the machine when the lap length is 50 m after the lap change.
2. Open the data screen 43.2.



43.2 Belt control act. values

Signal sensor [V] 5.121
Belt position [mm] 0.157 mm
-6.500 0.000 6.500

Avg. control-stroke 0.000 mm

*Figure 161: Data screen 43.2 Belt control act. values*

3. Examine the value of the **Avg. control-stroke** that shows the position of the control mechanism during the last lap formation procedure.
4. If the value is less than -0.500 mm, turn the adjusting spindle clockwise.
5. If the value is more than 0.500 mm, turn the adjusting spindle counterclockwise.

**Result** The belt control mechanism is adjusted.

### 7.9.3.25 Setting the Tension Draft V1

This procedure is used to adjust the tension draft V1 between the last calender roller and the winding apparatus.

The draft is adjusted with the pulley 1.

| | |
|---|---|
| A: Slack | 500 mm |
| B: Taut | 502.5 mm |

**Prerequisites** Make sure that the criteria are obeyed:
- ✓ The machine is at a standstill.
- ✓ A torque wrench (180 Nm) is necessary.

1. Examine the tension of the batt at the small lap diameter (*refer to ▸ 164*).
2. Remove the screw 2.

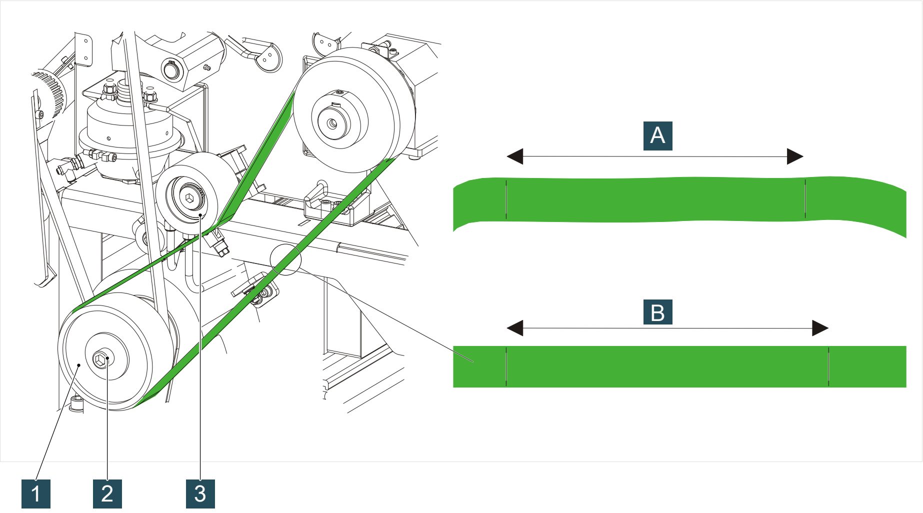


*Figure 162: Adjustment of the drive belt*

3. Replace the pulley 1.
4. Tighten the M20 screw 2 with the torque of 180 Nm.
5. Tighten the belt.
6. Make 2 marks on the belt when there is no tension on the belt.
7. Make sure the distance A between the 2 marks is 500 mm.
8. Tighten the belt until the distance B between the 2 marks is 502.5 mm.

**Result** The tension draft V1 is set.

### 7.9.3.26 Examining the Top End Position of the Opener Arm

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Select the **Service mode** in the data screen 80.1.
2. Lift the opener unit fully in the data screen 82.1.
3. Examine if the distance X is in the range of 1 mm to 4 mm.

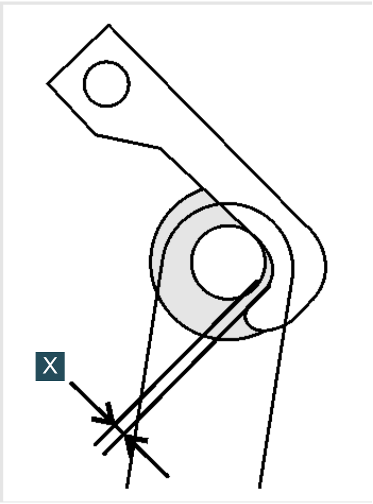


*Figure 163: Distance between the opener and the hook*

4. If the distance X is not in the range of 1 mm to 4 mm, do the standard setup of the opener at top.

**Result** The top end position of the opener is examined.

### 7.9.3.27 Adjusting the Proximity Switches of the Opener Arm

The proximity switch B207 sends the signal to lower the tension unit. The purpose of this procedure is to make sure that the proximity switch is on only when the opener arm is at the top end position.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Select the **Service mode** in the data screen 80.1.
2. Lift the opener arm to the top end position through the test function in the data screen 82.1.
3. Loosen the screw 5.

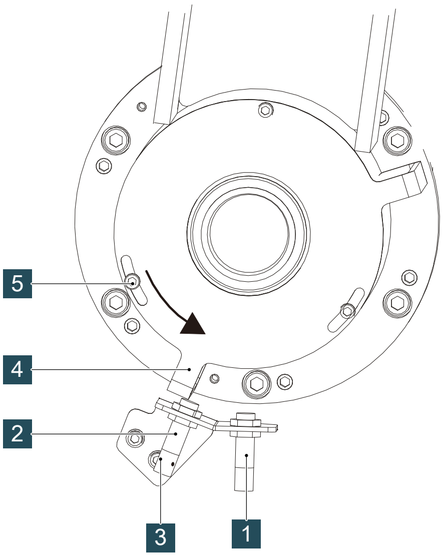


*Figure 164: Adjustment of the proximity switch*

4. Set the distance A to 2 mm.

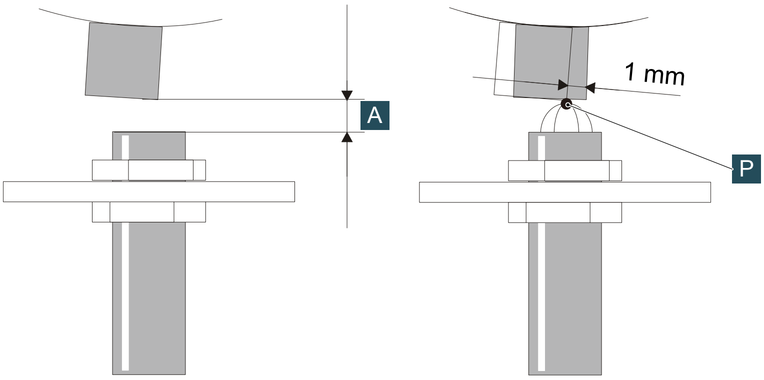


*Figure 165: Switch point of the proximity switch*

5. Fix the proximity switch B207 2 with the lock nuts.
6. Turn the switching cam 4 in the direction of the arrow so that the switching cam activates the proximity switch B207 2.
7. If the LED 3 is on, keep turning the switching cam 4 with a distance of 1 mm.

   ⇨ The switch point P is set.
8. Tighten the screw 5.
9. Lower the opener arm to the bottom end position in the data screen 82.1.
10. Do the step 3 to 8 again to adjust the proximity switch B208 1.

**Result** The proximity switches of the opener arm are set.

### 7.9.3.28 Setting the Top End Position of the Opener Arm

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.

1. Select the **Service mode** in the data screen 80.1.
2. Fully lift the opener arm through the test function in data screen 82.1.

   ⇨ The pneumatic cylinder is extended.
3. Adjust the fork head 1 to set the distance X in the range of 1 mm to 4 mm.

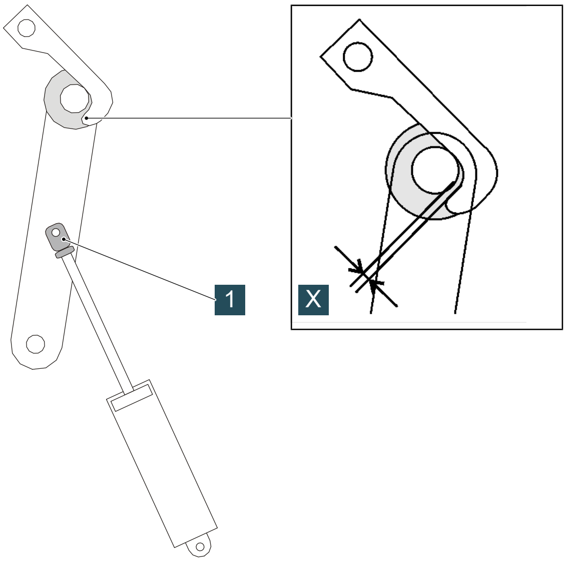


*Figure 166: Adjustment of the opener arm at the top end position*

**Result** The top end position of the opener arm is set.

### 7.9.3.29 Setting the Opener Arm Roller and the Pawls

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The top end position of the opener arm is set.

1. Select the **Service mode** in the data screen 80.1.
2. Lift the opener arm through the test function in data screen 82.1.

   ⇨ The pneumatic cylinder is extended.
3. Adjust the limit screws 2 to set the distance A between the limit screw and the pawl 1 to 3 mm on the 2 sides.

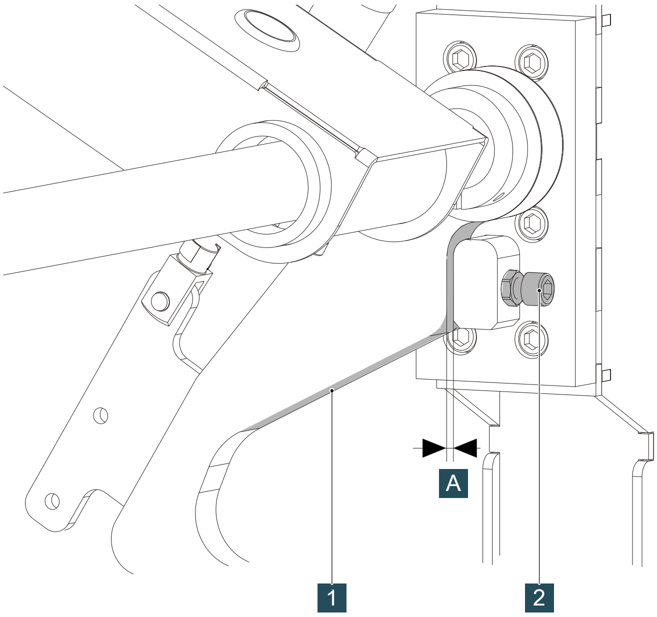


*Figure 167: Adjustments of the limit screw of the pawl*

4. Loosen the 8 bolts 3.

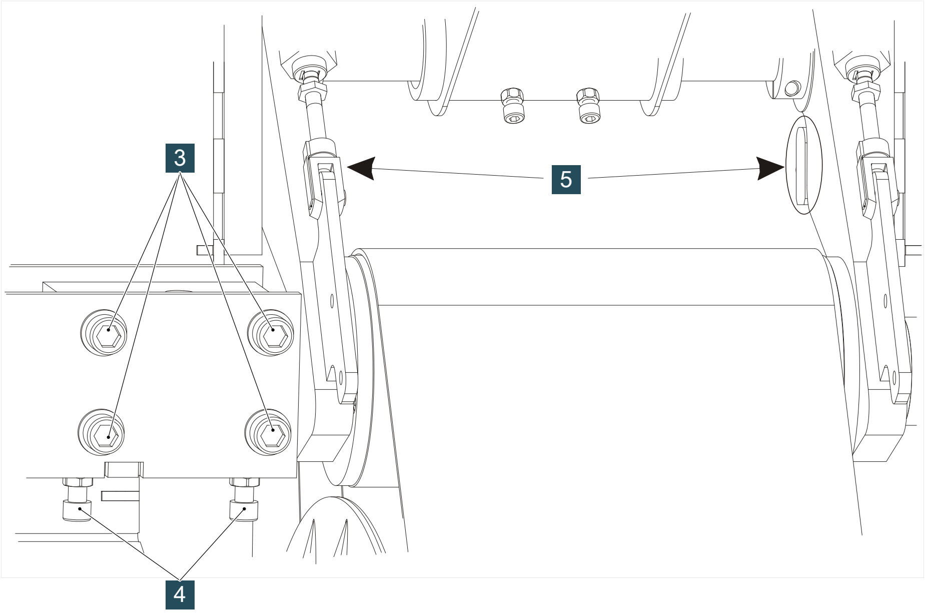


*Figure 168: Adjustment of the opener arm*

5. Set the distance B between the roller bearing and the opener arm in the range of 8 mm to 10 mm.

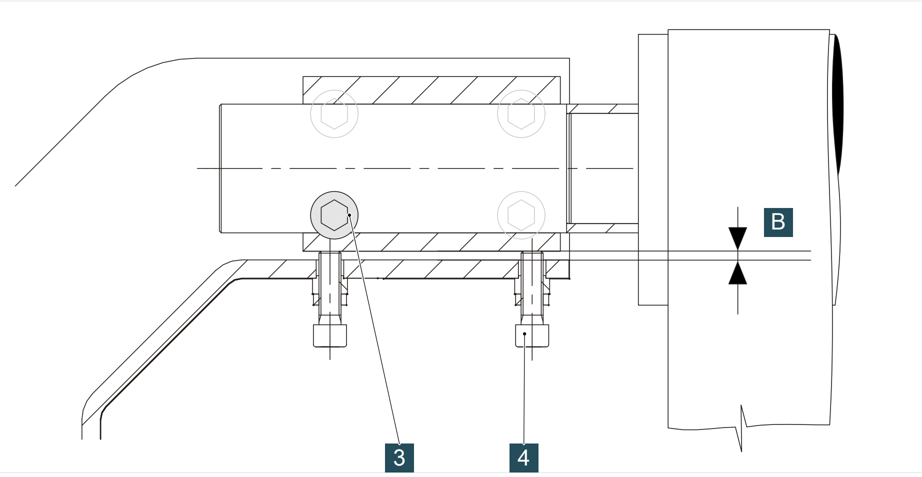


*Figure 169: Distance between the roller bearing and the opener arm*

6. Tighten the bolt 3 at the left bottom.
7. Adjust the screw 4 to push the roller bearing to the horizontal position.
8. Close the pawls of the opener unit through the test function in the data screen 82.1.
9. Lower the tensioner unit through the test function in the data screen 82.1.

   ⇨ There is tension in the belt.
10. Use a feeler gauge to examine if the pawls on the 2 sides touch the limit screw.
11. If the pawl on 1 side does not touch the limit screw, adjust the limit screw to touch against the pawl.
12. Tighten all 8 bolts 3.
13. Tighten the screw 4.

**Result** The opener arm roller and the pawls are set.

### 7.9.3.30 Examining the Holding Condition of the Opener Arm Pawls

**WARNING**

**Moving parts!**

Dangerous injuries because of the moving parts when you do the function test.

- Do **NOT** stay near the moving parts.
- Only the approved personnel are permitted to do the function test in the service mode.

**Prerequisites** Make sure that the criteria are obeyed:

✓ A feeler gauge is necessary.

1. Push the stop button after a lap change.
   - ⇨ A tube is put in the correct position.
   - ⇨ The opener arm is locked.
2. Select the **Service mode**in the data screen 80.1.
3. **WARNING! Moving parts! Dangerous injuries because of the mechanical movements of the parts when you do the function test.** Lower the tension lever in the data screen 82.1.
4. Open the right side doors.
5. Make sure that there is no distance between the opener arm pawl 1 and the opener arm roller 2 at the contact points 3 and 4.
6. Do the step 5 again to examine the opener arm pawl on the left side.

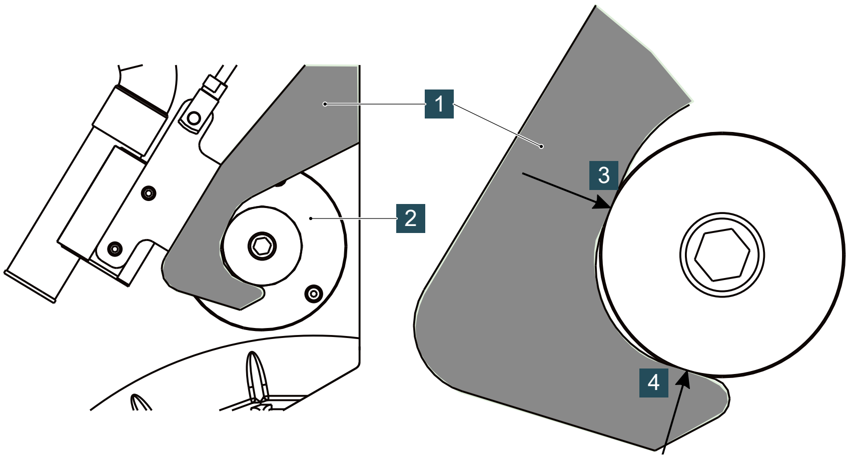


*Figure 170: Opener arm pawls*

7. If there is distance between the opener arm pawl 1 and the opener arm roller 2, set the opener arm roller and the pawls.

**Result** The holding condition of the opener arm pawls is examined.

## 7.9.3.31 Adjusting the Suction Nozzle

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Loosen the bolts 2.
4. Adjust the distance X between the suction nozzle 1 and the lap belt until the distance X is 5 to 6 mm when the lap belt is tightened.

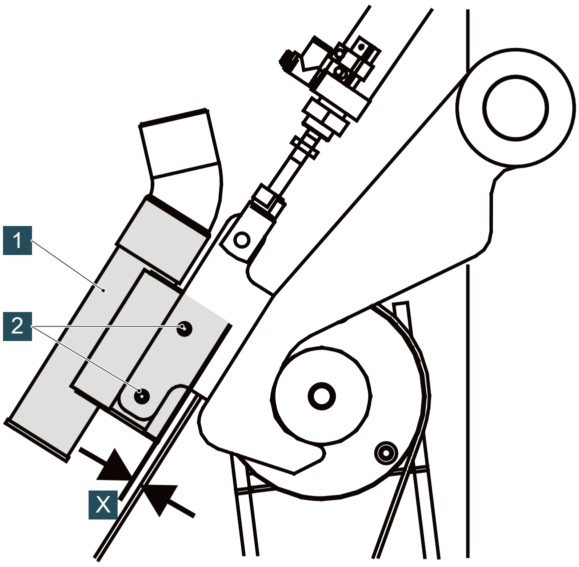


*Figure 171: Suction nozzle*

5. Tighten the bolts 2.

**Result** The suction nozzle is adjusted.

### 7.9.3.32 Adjusting the Proximity Switch of the Passive Lever

1. Push the stop button during the lap-winding.
   ⇨ The passive lever is at the top end position.
2. Set the main switch to the position OFF.
3. Padlock the main switch.
4. Loosen the lock nuts of the proximity switch 1.

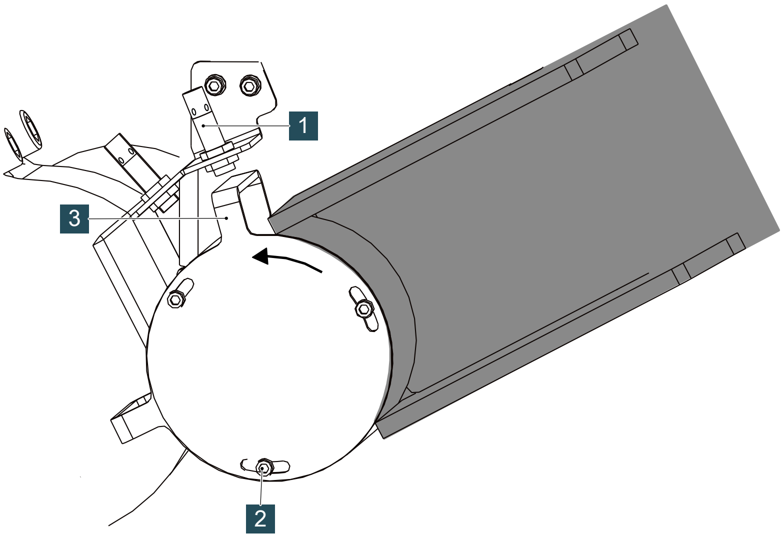


*Figure 172: passive lever and proximity switch*

5. Adjust the distance **S** to 2 mm.

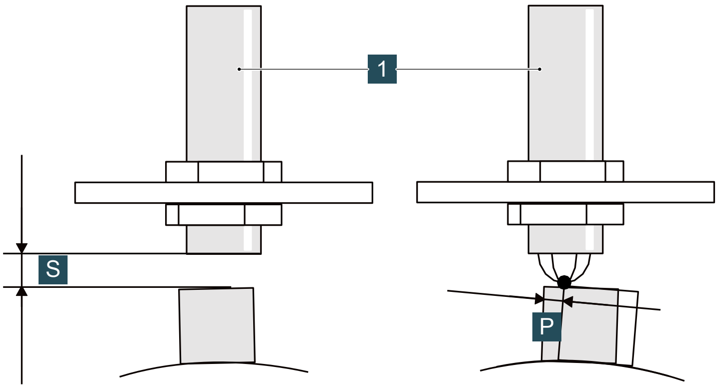


*Figure 173: Distance of the proximity switch*

6. Tighten the lock nuts of the proximity switch **1**.
7. Turn the switching cam **3** counterclockwise to the proximity switch **1**.
8. Adjust the distance **P** to 1 mm.
9. If the LED indicator of the proximity switch is off, turn the switching cam **3** counterclockwise in a small distance again.
10. Tighten the bolts **2**.

**Result** The proximity switch of the passive lever is adjusted.

### 7.9.3.33 Adjusting the Sensor of the Belt Control Mechanism

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ A lap is changed.
- ✓ The lap belt is loose. Remark : see Service info no 275
- ✓ An adjustment tool is necessary.

1. Push the stop button.
2. Set the main switch to the position OFF.
3. Padlock the main switch.
4. Put the adjustment tool **3** on the lap disk at the left side as shown in the figure.

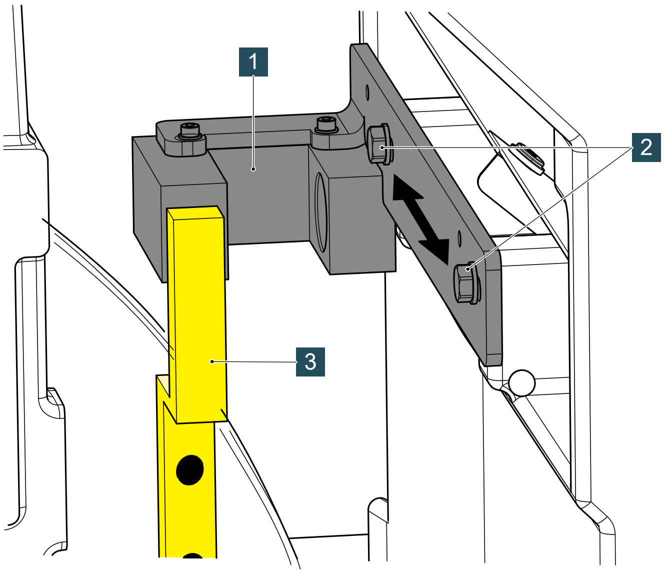


*Figure 174: Adjustment of the sensor of the belt control mechanism*

⇨ The adjustment tool 3 attaches to the lap disk because of the magnet.

5. Loosen the screws 2.
6. Move the sensor 1 until the sensor touches the adjustment tool 3.
7. Tighten the screws 2.
8. Remove the adjustment tool 3.

**Result** The sensor of the belt control mechanism is adjusted.

## 7.9.3.34 Adjusting the Belt Control

The operator must adjust the belt control until the lap belt operates in the middle of the lap disks and the lap belt does not touch the lap disks. This section shows the 5 steps of the procedure (1/5 – 5/5) in the data screen 42.1 for adjusting the belt control.

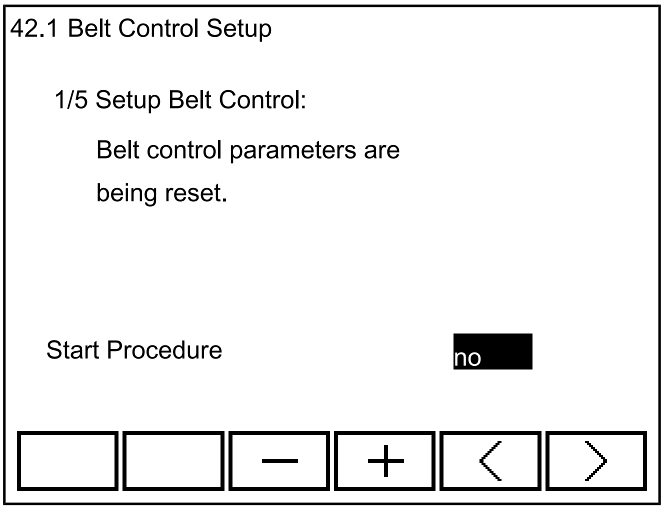
**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Select the **Service mode** in the data screen 80.1.
2. Open the data screen 42.1.

### 1/5 Setup Belt Control:

1. Select **yes** in the field **Start Procedure**.



42.1 Belt Control Setup

1/5 Setup Belt Control:

Belt control parameters are being reset.

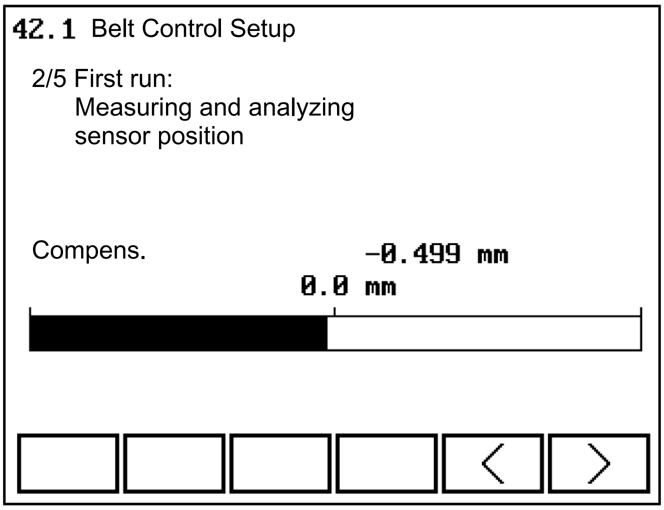
Start Procedure no

*Figure 175: Data screen 42.1*

2. Tap the key [Enter].
   - ➪ The procedure starts.
   - ➪ In the data screen 43.1, **Belt target pos.** is set to 0.000 mm.

## 2/5 Sensor referencing and first run:

1. Push the start button.
   - ➪ The belt is tightened.
   - ➪ The belt drive unit operates at a low speed.
   - ➪ The autoleveler tries to put the lap belt to the position 0.000 mm.
2. Wait until the leveling procedure is done and the machine stops.
3. If the autoleveler is working in the middle of the control range like the example below, continue the steps in **3/5 Set reference position:**.



42.1 Belt Control Setup

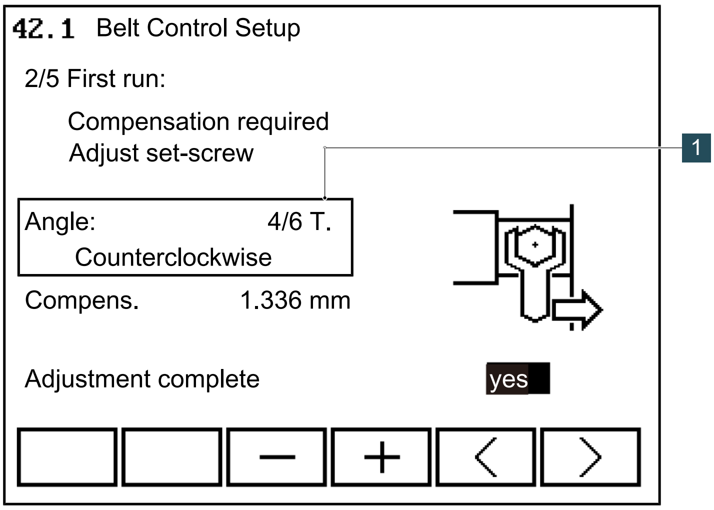
2/5 First run:
Measuring and analyzing sensor position

Compens. -0.499 mm

0.0 mm

*Figure 176: Data screen 42.1 (First run)*

4. If the autoleveler stops at the limit of the control range, do the steps from 5 to 7.
5. Record the information 1 in the data screen 42.1.



42.1 Belt Control Setup

2/5 First run:

Compensation required
Adjust set-screw

Angle: 4/6 T.
Counterclockwise

Compens. 1.336 mm

Adjustment complete yes

*Figure 177: Data screen 42.1 (2/5 mechanical adjustment)*

6. Turn the screw 2 in accordance with the information 1. (In the example, turn the screw 2 4/6 turns counterclockwise.)

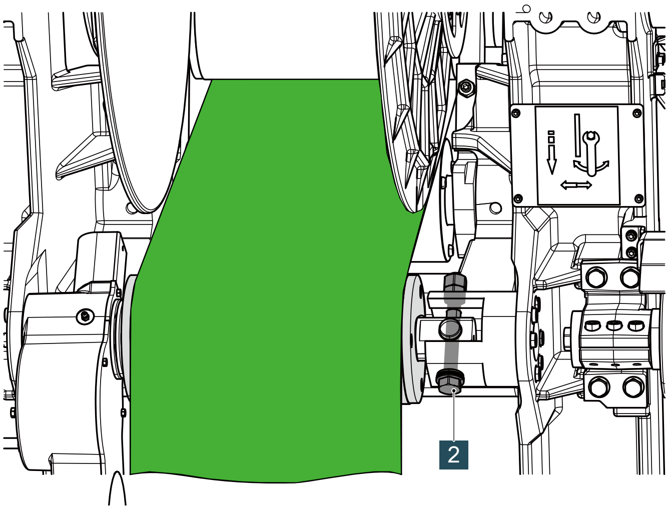
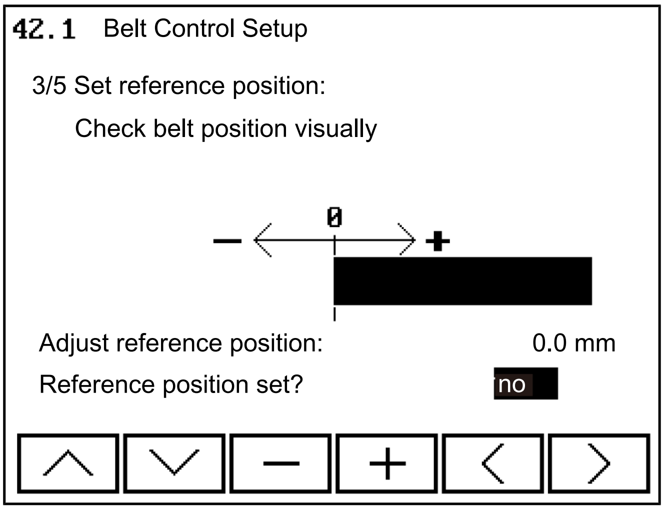


*Figure 178: Mechanical adjustment of belt control*

7. Select **yes** in the field **Adjustment complete**.
8. Tap the key [Enter].

### 3/5 Set reference position:

1. Visually examine the operating position of the lap belt.
2. If the belt runs too far to the left side, increase the value in the field **Adjust reference position:**.



**42.1** Belt Control Setup

3/5 Set reference position:
Check belt position visually

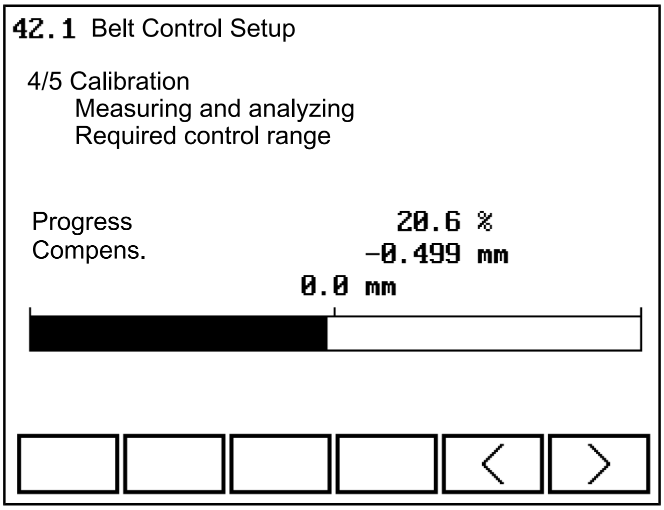
Adjust reference position: 0.0 mm
Reference position set? no

*Figure 179: Data screen 42.1 (Set reference position)*

3. If the belt runs too far to the right side, decrease the value in the field **Adjust reference position:**.
   ⇨ The belt operates in the middle position.
4. Select **yes** in the field **Reference position set?**.
5. Tap the key [Enter].

## 4/5 Calibration

1. Push the start button.
   ⇨ A full lap build-up is started with the parameters that are set in the menu 12.
2. Wait until the leveling procedure is done and the machine stops.
3. If the autoleveler is working in the middle of the control range like the example below, continue the steps in **5/5 End:**.



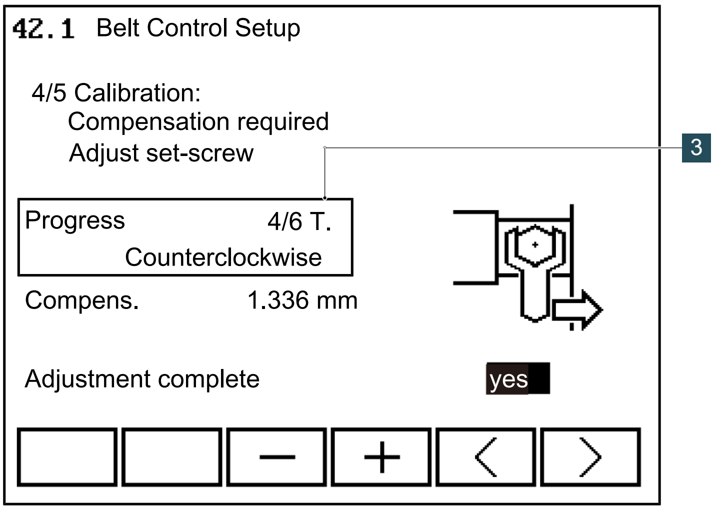
**42.1** Belt Control Setup

4/5 Calibration
Measuring and analyzing
Required control range

Progress 20.6 %
Compens. -0.499 mm
0.0 mm

*Figure 180: Data screen 42.1 (Calibration)*

4. If the autoleveler stops at the limit of the control range, do the steps from 5 to 7.
5. Record the information 3 in the data screen 42.1.



42.1 Belt Control Setup

4/5 Calibration:
Compensation required
Adjust set-screw

Progress 4/6 T.
Counterclockwise

Compens. 1.336 mm

Adjustment complete yes

*Figure 181: Data screen 42.1 (4/5 mechanical adjustment)*

6. Turn the screw 2 in accordance with the information 3. (In the example, turn the screw 2 4/6 turns counterclockwise.)

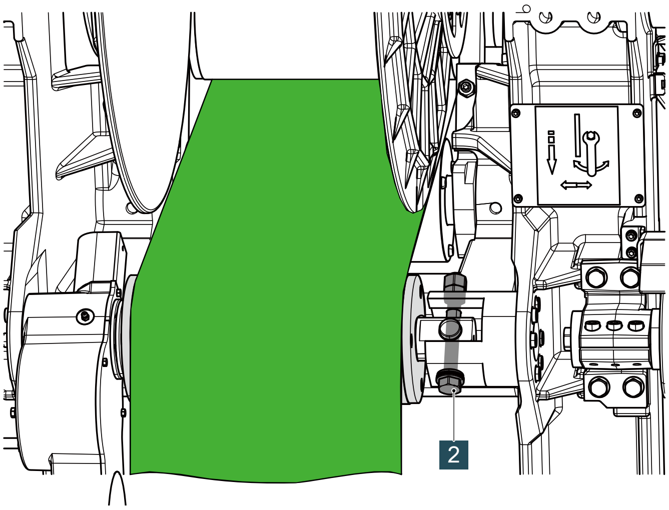
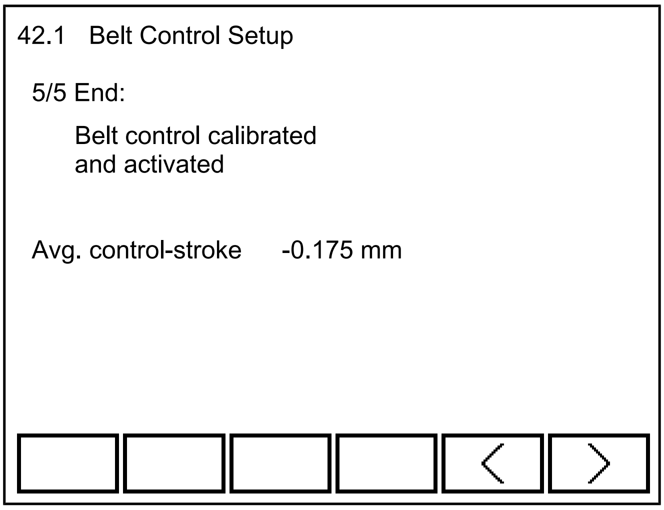


*Figure 182: Mechanical adjustment of belt control*

7. Select **yes** in the field **Adjustment complete**.
8. Tap the key [Enter].

### 5/5 End:

1. Record the value in the field **Avg. control-stroke**.



42.1 Belt Control Setup

5/5 End:

Belt control calibrated
and activated

Avg. control-stroke -0.175 mm

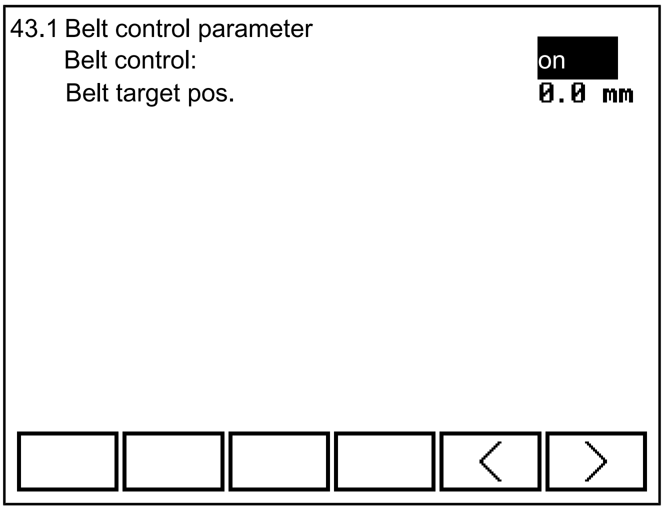
*Figure 183: Data screen 42.1 (End)*

2. If the value is not in the range of -0.300 mm to +0.300 mm, set the target position of the lap belt.
3. Select the **Automatic mode** in the data screen 80.1.

**Result** The belt control is adjusted.

### 7.9.3.35 Setting the Target Position of the Lap Belt

1. Visually examine the operating position of the lap belt.
2. If the belt operates too far to the left side, increase the value in field **Belt target pos.**.

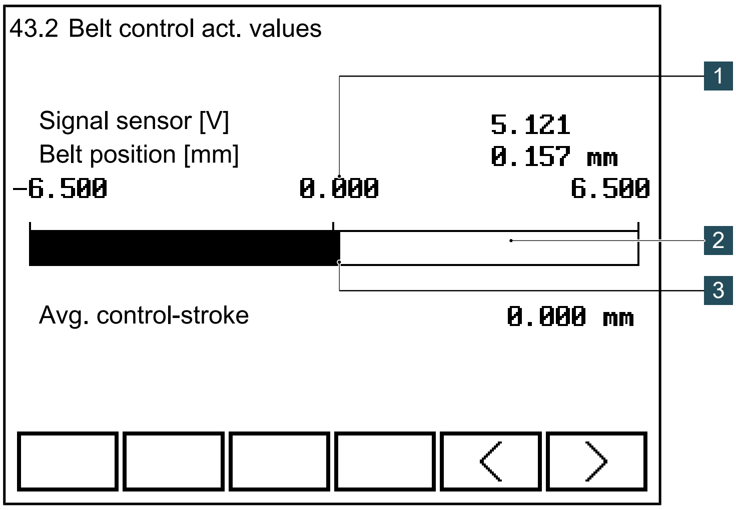


43.1 Belt control parameter
Belt control: on
Belt target pos. 0.0 mm

*Figure 184: Data screen 43.1*

3. If the belt operates too far to the right side, decrease the value in the field **Belt target pos.**
4. Push the start button.

5. Wait until a lap change is completed.
6. Go to the data screen 43.2.
7. Record the value in the field **Avg. control-stroke** .



43.2 Belt control act. values

Signal sensor [V] 5.121
Belt position [mm] 0.157 mm
-6.500 0.000 6.500

Avg. control-stroke 0.000 mm

*Figure 185: Data screen 43.2*

8. If the value is out of the range of -0.500 mm to +0.500 mm, adjust the belt control again.

**Result** The target position of the lap belt is set.

### 7.9.3.36 Examining the Movement of the Belt Control Mechanism

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Select the **Service mode** in the data screen 80.1.
2. Move the step motor in the data screen 82.1.
3. Look at the distance X to examine the movement of the alignment roller.

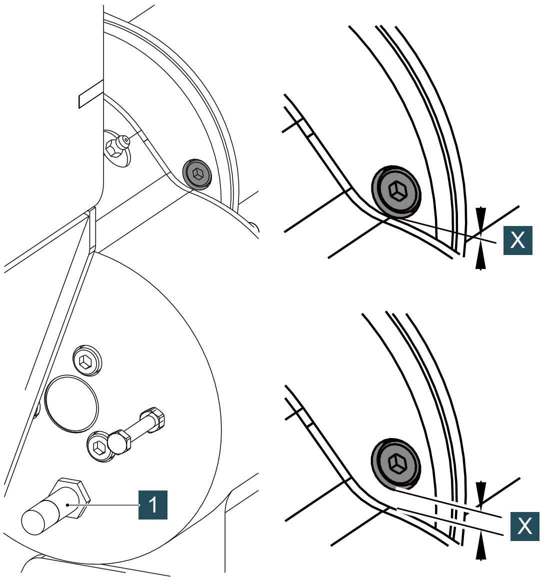


*Figure 186: Movement of the belt control mechanism*

4. If the alignment roller moves with vibration, tighten the toothed belt and lubricate the belt control mechanism.

   ⇨ The belt control mechanism is ready for operation.

5. Examine if the belt control mechanism moves a full revolution and stops at the 0 position. (The LED indicator of the proximity switch 1 is on when the proximity switch is aligned with the transmitter.)
6. If the belt control mechanism does not stop at the 0 position, set the proximity switch at the 0 position.

**Result** The movement of the belt control mechanism is examined.

### 7.9.3.37 Unlocking the Belt Control Mechanism at the 0 Position

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the screw 1.

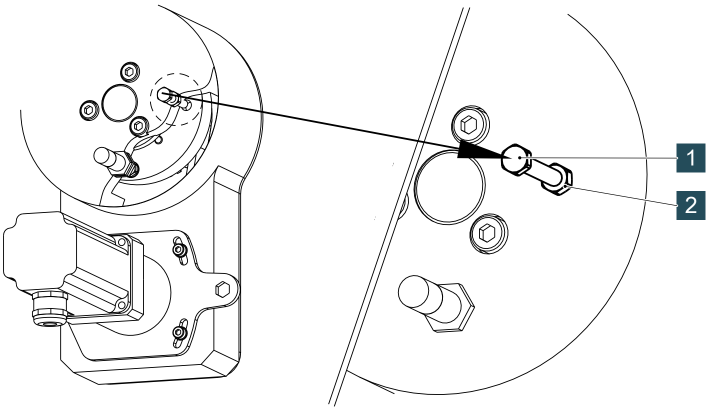


*Figure 187: Unlocking of the belt control mechanism*

⇨ The belt control mechanism is unlocked.

4. Turn in the screw 1 no more than 3 turns.
5. Tighten the nut 2.
6. Unlock the main switch.
7. Set the main switch to the position ON.

**Result** The belt control mechanism is unlocked at the 0 position.

### 7.9.3.38 Setting the Proximity Switch at the 0 Position

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

✓ The belt control mechanism is locked at the 0 position (*refer to ▸ 205*).

1. Put the proximity switch 1 fully into the hole.

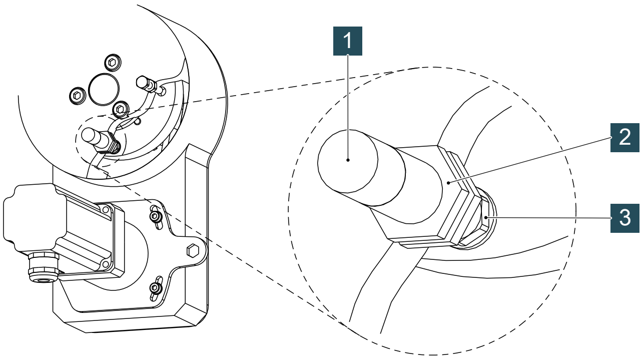


*Figure 188: Adjustment of the proximity switch of the belt control mechanism*

⇨ The proximity switch 1 is near the transmitter 3.

2. Turn the proximity switch 1 counterclockwise by 2 turns.
3. Tighten the nut 2.
4. Unlock the belt control mechanism.

**Result** The proximity switch is set at the 0 position.

### 7.9.3.39 Setting the Position Plates of the Lap Belt

To adjust the position plates, the operator must refer to the lap belt position. When the lap is pushed out from the lap head, and the new tube is not yet inserted, the lap belt must be in the center position of the position plates.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is in operation.

1. Push the stop button when the lap is pushed out from the lap head, and the new tube is not inserted yet.
2. Set the main switch to the position OFF.
3. Padlock the main switch.
4. Open the left side door of the machine.
5. Examine the position of the lap belt in accordance with the position plate 1.

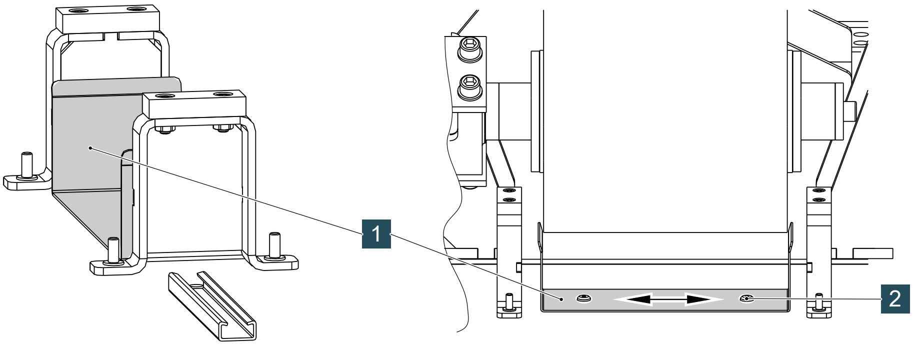


*Figure 189: Position plate at the tension lever*

6. If the lap belt is not in the center position of the position plate 1, do the steps 7 to 9.
7. Loosen the screws 2.
8. Move the position plate 1 until the lap belt is in the center position of the position plate 1.
9. Tighten the screws 2.
10. Examine the position of the lap belt in accordance with the position plate 4.

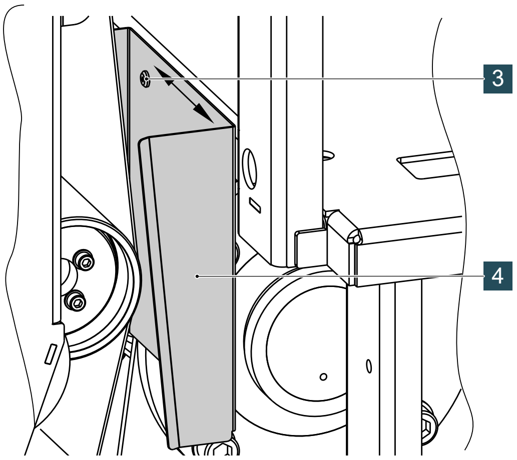


Figure 190: Position plate at the passive lever

11. If the lap belt is not in the center position of the position plate 4, do the steps 12 to 14.
12. Loosen the screws 3.
13. Move the position plate 4 until the lap belt is in the center position of the position plate 4.
14. Tighten the screws 3.
15. Close the lap head door on the right side of the machine.
16. Unlock the main switch.
17. Set the main switch to the position ON.

**Result** The position plates of the lap belt are set.

### 7.9.3.40 Setting the Tension Lever

A safety block is necessary for the setting of the tension lever. The safety block is shown in the figure that follows.

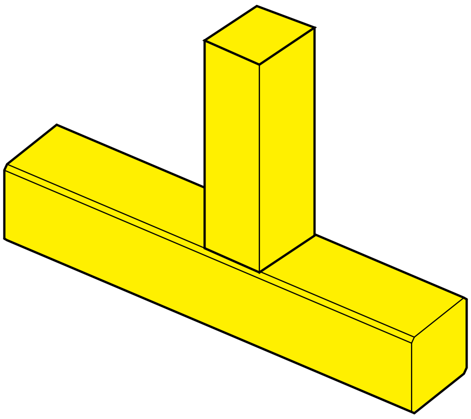


Figure 191: Safety block

The safety blocks must have the following dimensions:

- The vertical block: 100 mm x 100 mm x 375 mm
- The horizontal block: 100 mm x 100 mm x 540 mm

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.
✓ A torque wrench (60 Nm) is necessary.

## CAUTION

**Tension lever roller can fall!**

Hand injury

▶ Put a safety block under the tension lever roller before setting the tension lever.

1. Set the **Service mode** in the data screen 80.1.
2. Lower the tension unit in the data screen 82.1.
3. Open the lap head door on the left side of the machine.
4. Make sure that the proximity switch B211 5 operates correctly.

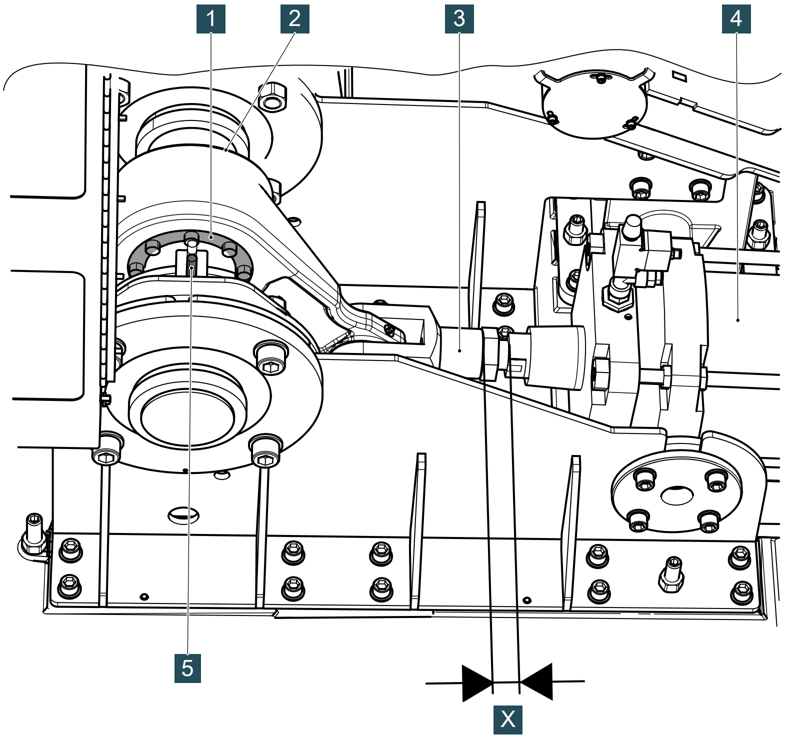


*Figure 192: Tension cylinder and connection parts*

5. Set the main switch to the position OFF.
6. Padlock the main switch.
7. Put the safety block 7 below the tension lever roller 6.

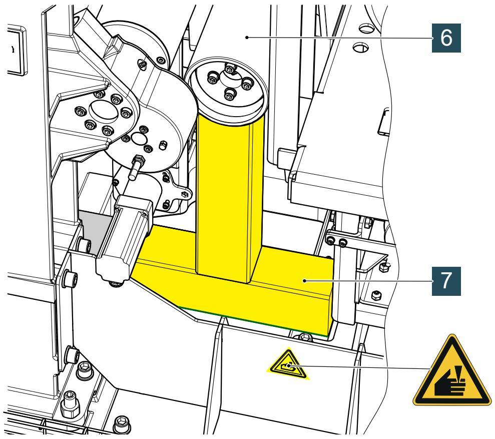


*Figure 193: Safety block of the tension roller*

8. **CAUTION! Tension lever roller can fall! Hand injury.** Loosen all screws of the tension part 1 and tension part 2.
9. Loosen the nut at the fork head 3.
10. Set the distance X at the fork head 3 to 36 mm.
11. Tighten the nut at the fork head 3.
12. Make sure that the tension lever roller 6 touches the safety block 7.
13. Tighten all the screws of the tension part 1 and tension part 2 with the torque of 60 Nm.
14. Remove the safety block 7.
15. Close the left side door.

**Result** The tension lever is set.

### 7.9.3.41 Setting the Proximity Switch B211

The proximity switch B211 monitors the top position of the tension lever roller.

The proximity switch B211 1 is off before the lap gets the necessary diameter to prevent the batt from winding too much on the lap. When the batt is wound too much, the lap cannot be pushed out because there is tension in the opener arm roller.

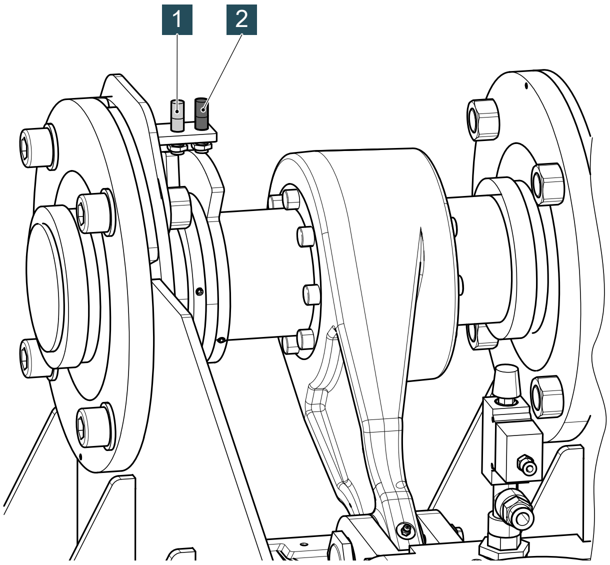


*Figure 194: Proximity switches for tension arm roller*

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The tension lever is set.
- ✓ The machine has no tube.

1. Select the **Service mode** in the data screen 80.1.
2. Lift the tension unit in the data screen 82.1.
3. Set the main switch to the position OFF.
4. Padlock the main switch.
5. Open the left side door.
6. Loosen the screws at the cam disk 3.

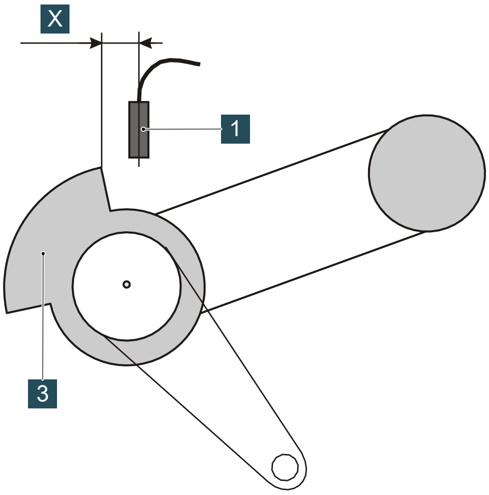


*Figure 195: Proximity switch B211 at the cam disk*

7. Turn the cam disk 3 to set the distance X between the cam disk 3 and the proximity switch B211 1 to the range of 18 mm to 19 mm.
8. Tighten the screws at the cam disk 3.
9. Close the left side door.
10. Unlock the main switch.
11. Set the main switch to the position ON.
12. Make a lap.
13. If the completed lap diameter is more than 570 mm, adjust the proximity switch B211 again.

**Result** The proximity switch B211 is set.

### 7.9.3.42 Optimizing the Proximity Switch B211

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The completed lap diameter is more than 570 mm.

## NOTICE

**Lap diameter is too large!**

Damage to the belt and the axle.

- ▶ Examine the lap build-up procedure from the delivery door of the machine.
- ▶ If the machine does not stop when the lap diameter is more than 580 mm, push the stop button.

1. Increase the lap length by 5 m in the data screen 12.1.
2. Start the lap build-up procedure.
3. Examine the lap diameter change from the front door.
4. If the lap diameter is almost 580 mm, push the stop button.
5. Open the left side door.
6. If the proximity switch B211 is on before the lap diameter is 580 mm, turn the cam disk 2 clockwise by 2 mm.
7. Start the machine to continue the lap build-up procedure.
8. After the lap is completed, make a new lap.
9. Measure the new lap diameter.
10. If the new lap diameter is less than 580 mm, do the steps from 1 to 9 again until the lap diameter is 580 mm.
11. Turn the cam disk 2 counterclockwise until the proximity switch B211 1 is on (refer to the position shown in the figure that follows).

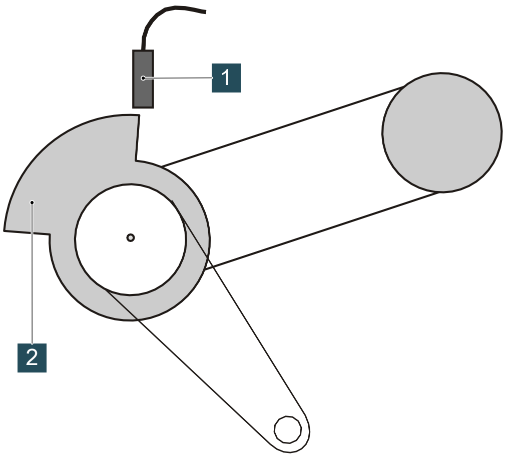


*Figure 196: Optimized position of the proximity switch B211*

12. Set the lap length to the necessary value in the data screen 12.1.

**Result** The proximity switch B211 is optimized.

### 7.9.3.43 Locking the Belt Control Mechanism at the 0 Position

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.

⇨ The motor shaft 3 can be turned.

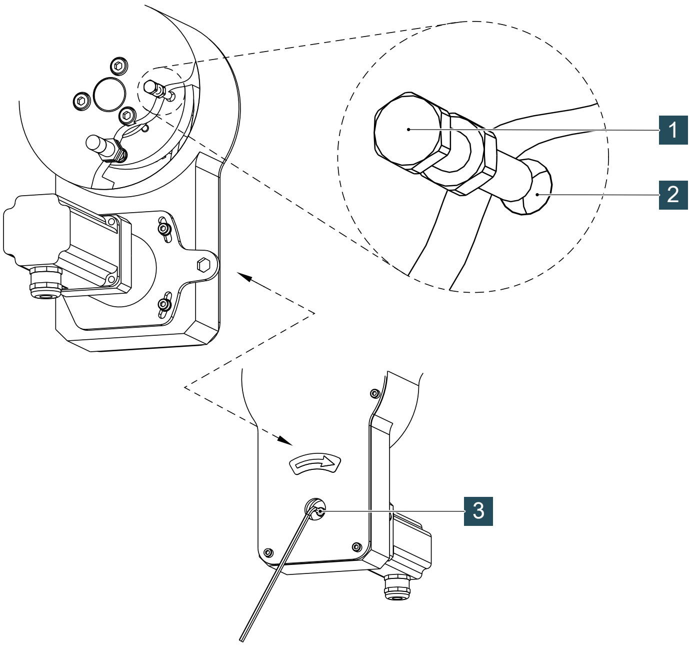


*Figure 197: Locking of the belt control mechanism*

3. Install the screw 1 into the hole 2 fully.
4. If the operator cannot turn the fully screw 1 into the hole 2, turn the motor shaft 3 clockwise with a hexagonal key.

   ⇨ The screw 1 is installed into the hole fully.
5. Unlock the main switch.
6. Set the main switch to the position ON.

**Result** The belt control mechanism is locked at the 0 position.

### 7.9.3.44 Setting the Proximity Switch B212

The proximity switch B212 monitors the bottom position of the tension lever roller.

When the tension lever roller is in the bottom position, the proximity switch B212 2 is on. The tension lever roller can go to the bottom position only when the machine has no tube.

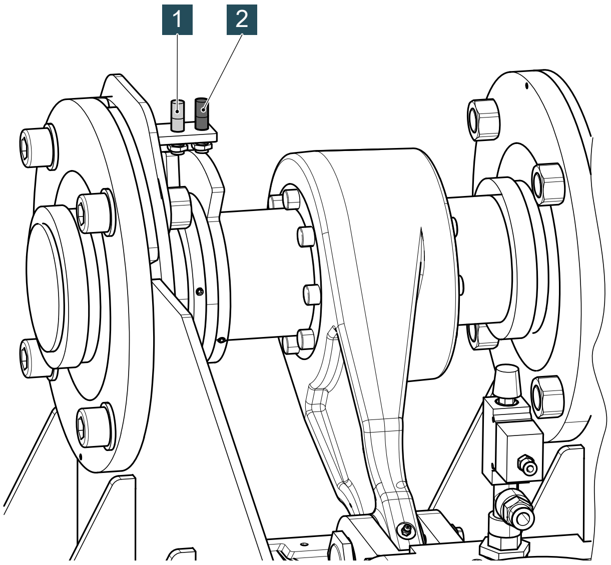


*Figure 198: Proximity switches for the tension lever roller*

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The machine has no tube.

1. Select the **Service mode** in the data screen 80.1.
2. Lower the tension unit in the data screen 82.1.
3. Open the left side door.
4. Loosen the screws at the cam disk 3.

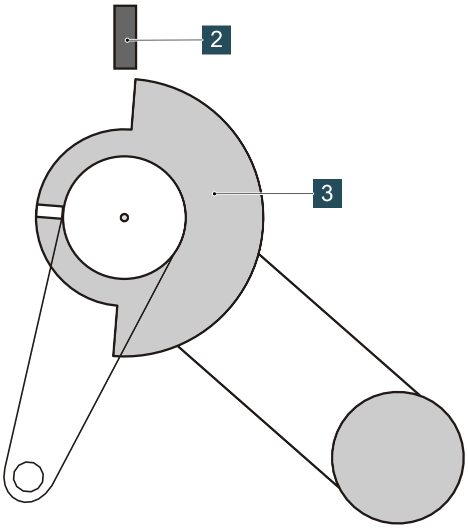


*Figure 199: The proximity switch B212 at the cam disk*

5. Turn the cam disk 3 to make sure that the position of the cam disk 3 and the proximity switch B212 2 is as shown in the figure above.

   ⇨ The proximity switch B212 2 is off.

6. Tighten the screws at the cam disk 3.
7. Close the left side door.

**Result** The proximity switch B212 is set.

### 7.9.3.45 Setting the Tube Lifting Device (SERVOlap)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Examine the procedure of the tube feed in the service mode.
2. If the tube is not put in the machine correctly, do the steps 3 to 12.
3. Put a tube 2 on the tube lifting device.

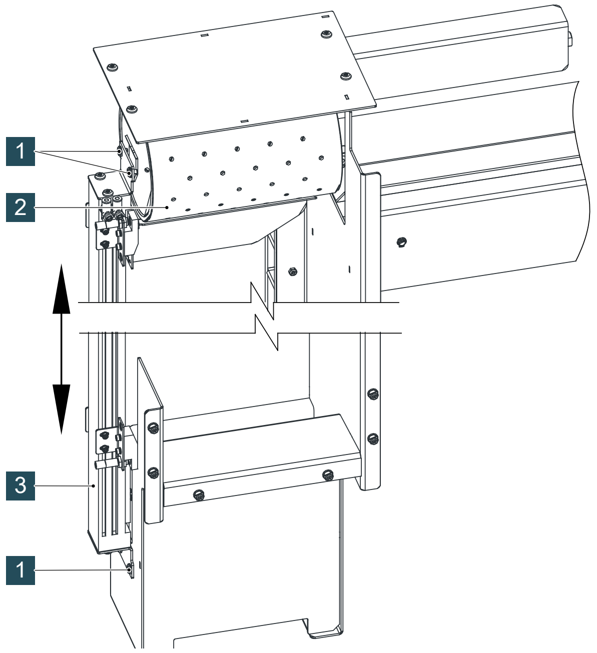


*Figure 200: The tube lifter adjustment (SERVOlap)*

4. Select the **Service mode** in the data screen 80.1.
5. Lift the tube in the data screen 82.1.
6. Measure the distance X.

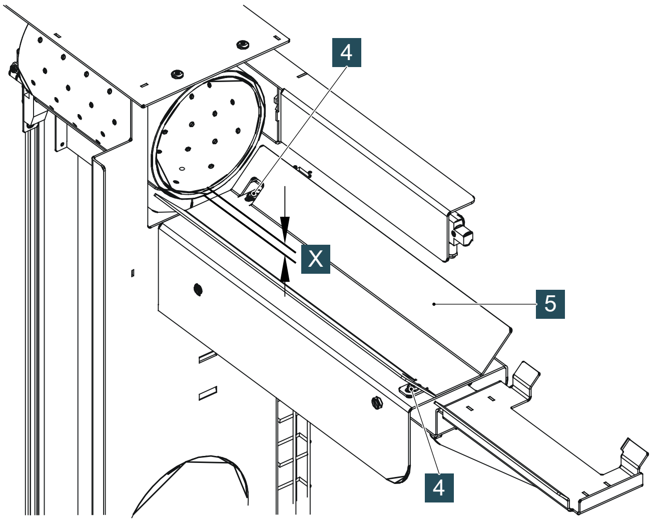


*Figure 201: Adjustment of the tube transport guide (SERVOlap)*

7. If the distance X is not in the range of 1 mm to 3 mm, do the steps 8 to 10.
8. Loosen the screws 1.
9. Adjust the height of the cylinder 3 to set the distance X in the range of 1 mm to 3 mm.
10. Tighten the screws 1.

11. If the tube is not moved to the center position of the tube transport guide 5, do the steps 12 to 14.
12. Loosen the screws 4.
13. Adjust the position of the tube transport guide 5 to make sure that the tube is moved to the center position of the tube transport guide 5.
14. Tighten the screws 4.

**Result** The tube lifting device is set.

### 7.9.3.46 Setting the Proximity Switches of Tube Lifting System (SERVOlap)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The tube lifting device is set.

1. Select the **Service mode** in the data screen 80.1.
2. Move the tube lifting device to the bottom end position in the data screen 82.1.
3. Loosen the lock nuts 2 at the proximity switch 1 at the bottom end position.

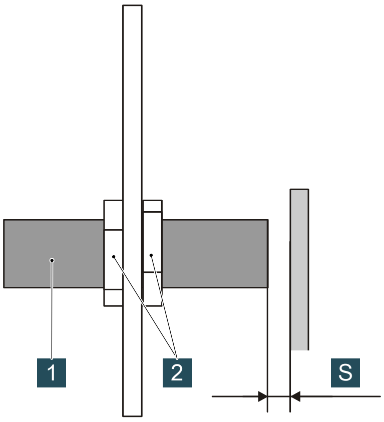


*Figure 202: The side view of the proximity switch of the tube lifting device*

4. Set the distance S to 2 mm.
5. Tighten the lock nuts 2 at the proximity switch 1.
6. Do the steps 2 to 5 to set the proximity switch at the top end position.

**Result** The proximity switches are set.

### 7.9.3.47 Setting the Tube Lifting Device (SERVOtrolley)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Examine the procedure of the tube feed in the service mode.
2. If the situation of the tube feed is necessary to be adjusted, do the steps from 3 to 11.

3. Put a tube 2 on the tube lifting device 1.

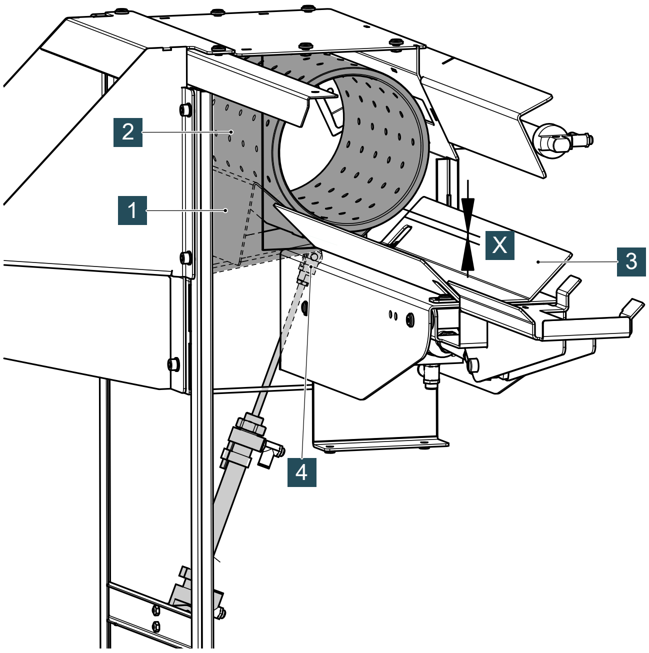


*Figure 203: Adjustment of the tube lifting device (SERVOtrolley)*

4. Select the **Service mode** in the data screen 80.1.
5. Lift the tube in the data screen 82.1.
6. Examine the distance X.
7. If the distance X is not in the range of 1 mm to 3 mm, loosen the nut at the cylinder head 4.
8. Turn the cylinder head 4 to set the distance X to the range of 1 mm to 3 mm.
9. If the center line of the tube 2 is not just above the center of the tube transport guide 3 after the tube is moved to the tube transport guide 3, loosen the 2 screws at the tube transport guide 3.
10. Adjust the position of the tube transport guide 3.
11. Tighten the 2 screws on the tube transport guide 3 to make sure that the tube is moved to the tube transport guide 5 without offset.

**Result** The tube lifting device is set.

### 7.9.3.48 Setting the Speed of the Tube Arm

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Adjust the throttle 1 to decrease the lifting speed of the tube arm.
2. Adjust the throttle 2 to decrease the lowering speed of the tube arm.

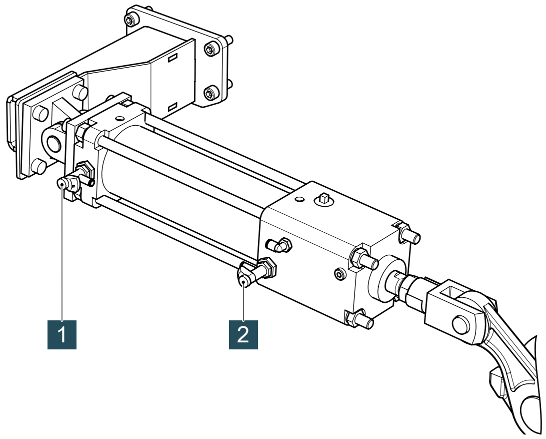


*Figure 204: Tube arm*

⇨ The speed of the tube arm is set.

### 7.9.3.49 Unlocking the Tube Arm

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Remove the air pipes from the throttles 3 and 4.
2. Supply 6 bar pressure to the connection 2 or turn the part 1 counterclockwise.

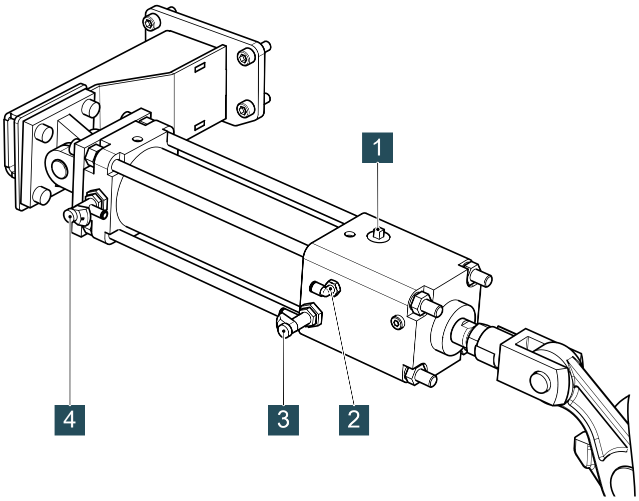


*Figure 205: The lock of the tube arm cylinder*

**Result** The tube arm is unlocked.

### 7.9.3.50 Setting the Tube Position (When the Tube Is Put into the Lap Disks)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

✓ A tube is put in the machine.

1. Select the **Service mode** in the data screen 80.1.
2. Make the tube arm 2 move the tube 5 to the center position of the lap disks 4 in the data screen 82.1.

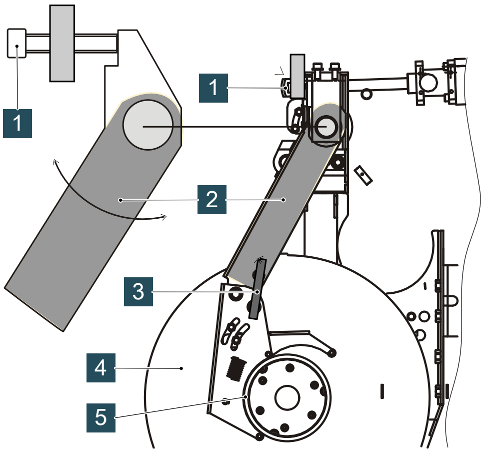


*Figure 206: Center position of the tube at the bottom*

3. Examine if the offset value between the center position of the tube and the center position of the lap disk is in the range of ± 1 mm.
4. If the offset value is out of the range of ± 1 mm, adjust the limit screw 1 and the spindle 3.
5. Adjust the limit screw 1 to move the tube arm 2 horizontally.
6. Adjust the spindle 3 to move the tube arm 2 vertically.
   - ⇨ The tube arm 2 moves horizontally when the limit screw 1 is adjusted.
   - ⇨ The tube arm 2 moves vertically when the spindle 3 is adjusted.

**Result** The tube position is set.

### 7.9.3.51 Setting the Tube Position (When the Tube Is on the Tube Bridge)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.
✓ A tube is put in the machine.
✓ The tube arm is set with the limit screw.
✓ The tube arm is set with the spindle at the tube arm.

1. Select the **Service mode** in the data screen 80.1.
2. Make the tube arm 1 hold the tube in the data screen 82.1.

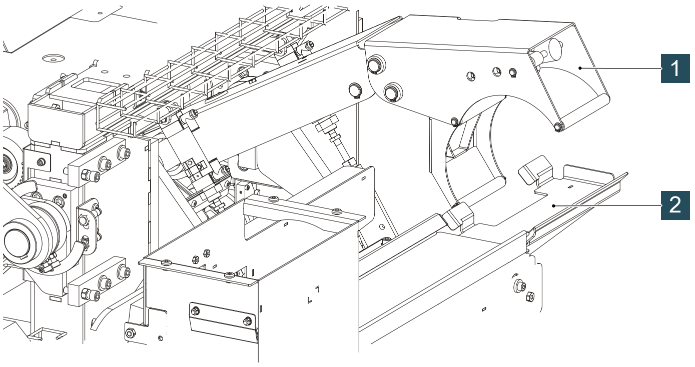


Figure 207: Tube bridge and tube arm

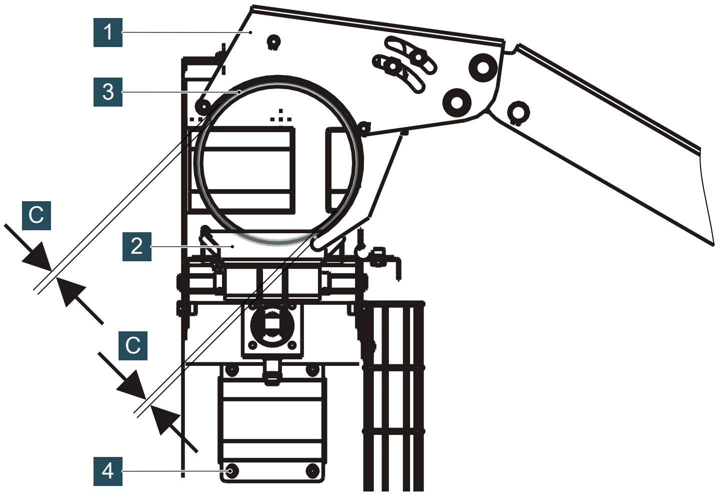


Figure 208: Distance between the tube and the tube arm

3. Examine if the distance C between the tube arm 1 and the tube 3 is less than 3 mm.
4. If the distance C between the tube arm 1 and the tube 3 is more than 3 mm, do the steps 5 to 7.
5. Loosen the screws 4.
6. Adjust the position of the tube bridge 2 to set the distance C less than 3 mm.
7. Tighten the screws 4.

**Result** The tube position is set.

### 7.9.3.52 Setting the Proximity Switches of the Tube Arm

This section has the information about the adjustment of the proximity switches of the tube arm.

The proximity switch B1 3 monitors the bottom end position of the tube arm. The proximity switch B2 2 monitors the top end position of the tube arm.

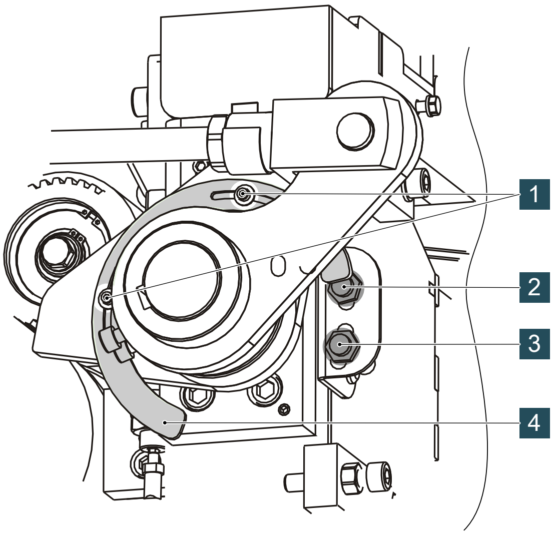


Figure 209: Position of the proximity switches of the tube arm

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The tube position is set when the tube is put into the lap disks (*refer to ▸ 211*).
- ✓ The tube position is set when the tube is on the tube bridge (*refer to ▸ 212*).

1. Select the **Service mode** in the data screen 80.1.
2. Lower the tube arm in the data screen 82.1.
3. Loosen the nuts 5 at the proximity switch B2 2.
4. Set the distance S between the proximity switch B2 2 and the plate 4 to 2 mm.
5. Tighten the nuts 5.

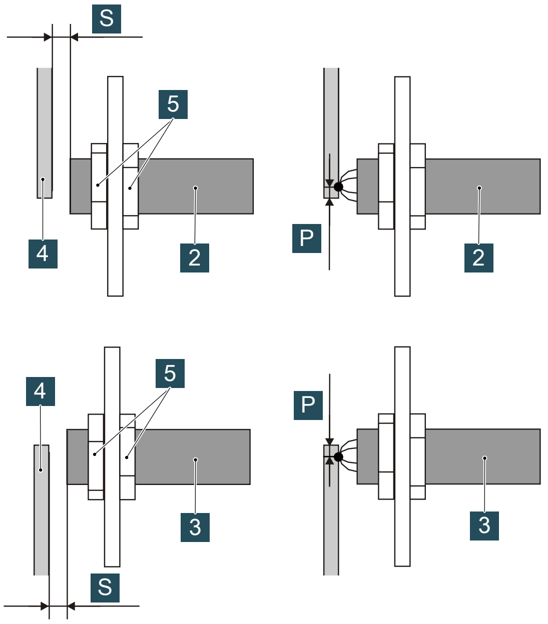


*Figure 210: Side view of the proximity switches of the tube arm*

6. Loosen the screws 1.
7. Move the plate 4 to set the distance P to the range of 0.5 mm to 1 mm.
8. If the LED indicator of the proximity switch B2 2 is off, increase the distance P but make sure the distance is in the range of 0.5 mm to 1 mm.
9. Tighten the screws 1.
10. Lift the tube arm in the data screen 82.1.
11. Loosen the nuts 5 at the proximity switch B1 3.
12. Set the distance S between the proximity switch B1 3 and the plate 4 to 2 mm.
13. Tighten the nuts 5.
14. Loosen the screws 1.
15. Move the plate 4 to set the distance P to the range of 0.5 mm to 1 mm.
16. If the LED indicator of the proximity switch B1 3 is on, increase the distance P but make sure the distance is in the range of 0.5 mm to 1 mm.
17. Tighten the screws 1.

**Result** The proximity switches of the tube arm are set.

### 7.9.3.53 Setting the Proximity Switches of the Tube Gripper

This section has the information about the adjustment of the proximity switches of the tube gripper.

The position of the tube gripper 3 is monitored by the proximity switches B4 1 and B5 2.

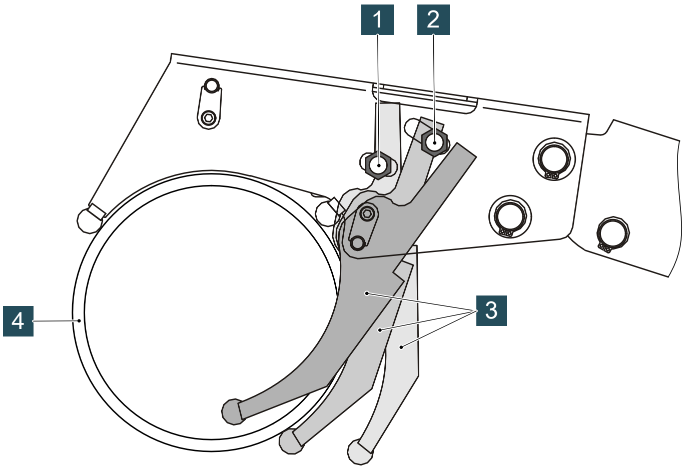


*Figure 211: The side view of the proximity switches of the tube gripper*

- If the tube gripper 3 is open, the proximity switch B4 1 is on, and the proximity switch B5 2 is off.
- If the tube gripper 3 is closed with a tube 4, the proximity switch B4 1 is off, the proximity switch B5 2 is on.
- If the tube gripper 3 is closed without a tube 4, the proximity switches B4 1 and B5 2 are off.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

✓ A tube is put in the machine.

1. Select the **Service mode** in the data screen 80.3.
2. Open the tube gripper 3 in the data screen 84.3.
3. Loosen the nuts 6 at the proximity switch B4 1.

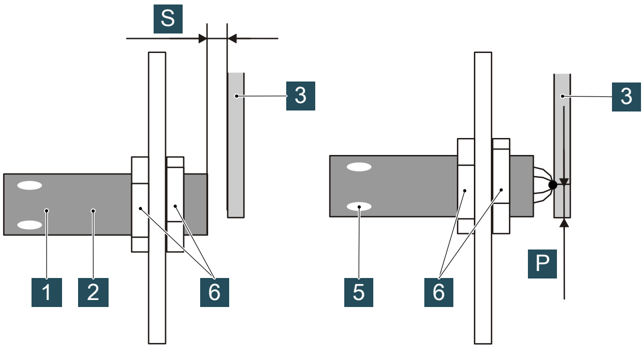


*Figure 212: Adjustment of the proximity switches of the tube gripper*

4. Set the distance S to 4 mm.

5. Set the distance P to 4 mm.
   ⇨ The LED indicator of the proximity switch B4 1 is on.
6. Tighten the nuts 6.
7. Close the tube gripper 3 with a tube inside 4 in the data screen 84.3.
8. Loosen the nuts 6 at the proximity switch B5 2.
9. Set the distance S to 4 mm.
10. Set the distance P to 4 mm.
    ⇨ The LED indicator of the proximity switch B5 2 is on.
11. Tighten the nuts 6.

**Result** The proximity switches of the tube gripper are set.

### 7.9.3.54 Examining the Suction of the Suction Pipe Connection

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Measure the vacuum pressure at the pipe connections 1 or 2.

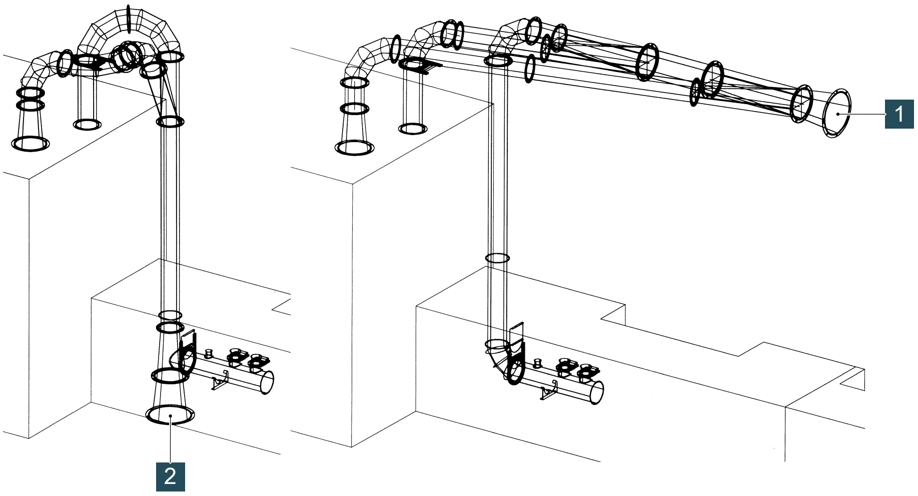


*Figure 213: The vacuum pipes*

2. If the measured value of the vacuum pressure at the connections 1 or 2 is less than 1000 PA (100 mm water column), do the steps 3 to 5.
3. Set the pressure of the calender rollers.
4. Set the suction of the drafting system.
5. Set the suction of the calender rollers and the lap compression space.

**Result** The suction of the suction pipe connection is examined.

### 7.9.3.55 Setting the Suction of the Calender Rollers and the Lap Compression Space

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Open the slider 3 and slider 4.

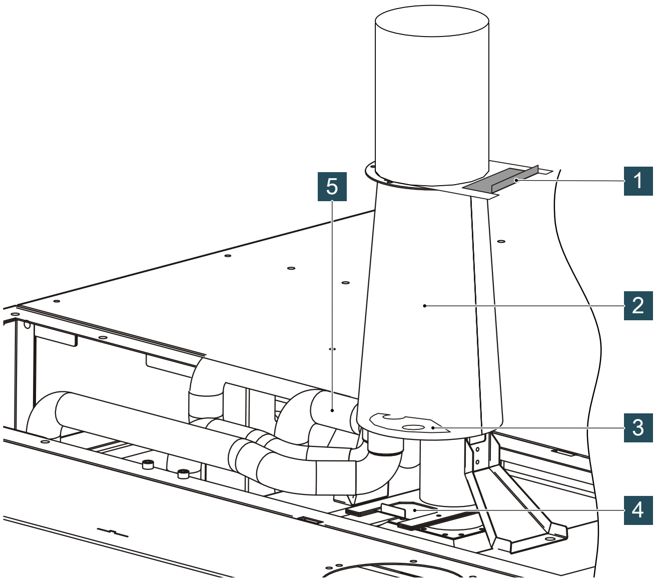


*Figure 214: Suction structure of the calender rollers and lap compression*

2. Set the vacuum pressure in the pipe 2 to 95 mm water column.
3. Move the slider 4 to set the vacuum pressure in the pipe 5 to 65 mm water column.
4. Turn the baffle 6 to decrease the vacuum pressure in the pipes 7 and make sure that the vacuum pressure in the pipes 7 is sufficient to make the suction points clean.

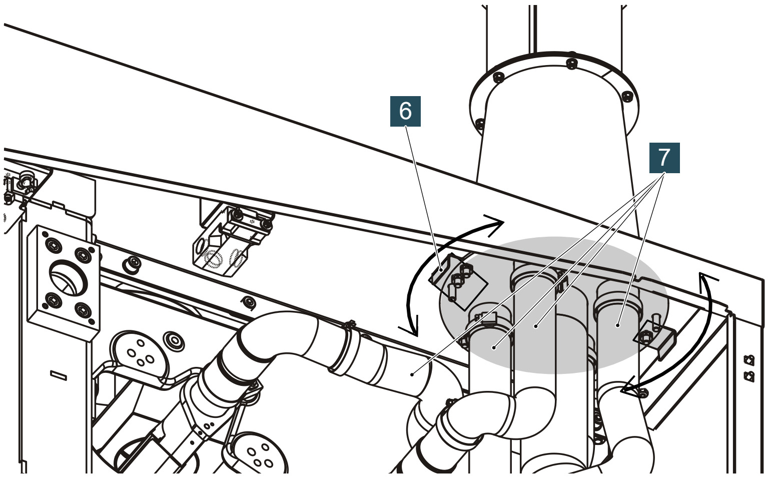


*Figure 215: The bottom view of the suction pipes in the lap head*

**Result** The suction of the calender rollers and the lap compression space is set.

## 7.9.4 Longitudinal Section

This section contains the information about the operation of the longitudinal section.

### 7.9.4.1 Setting the Belt Tension (between the Table Calender and the Calender Rollers in the Lap Head)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Loosen the nut at the pulley 1.

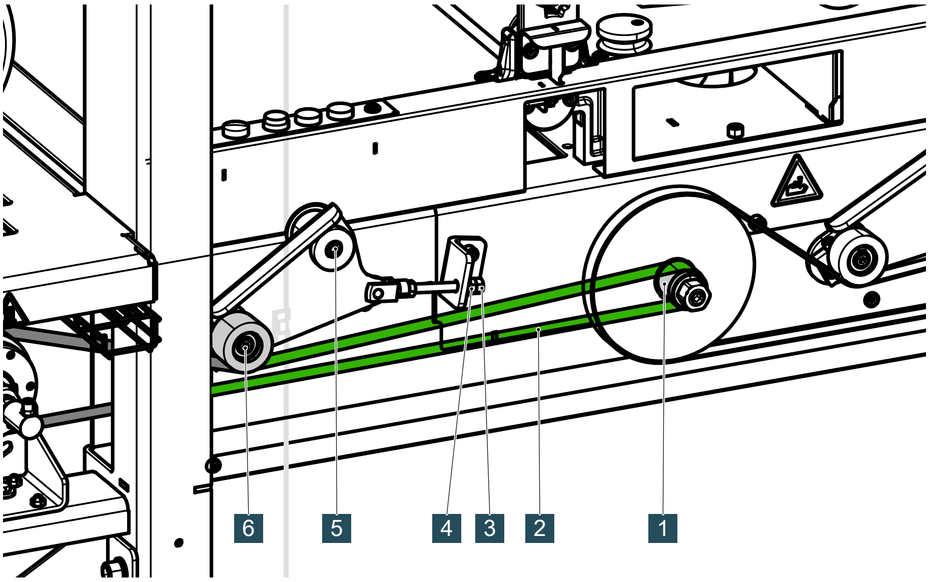


*Figure 216: The belt connecting the table calender and the calender rollers*

⇨ The belt 2 is loosened.

4. Remove the belt 2.
5. Replace the pulley 1.
6. On the loosened belt 2, make 2 marks between which the distance is 400 mm.
7. Loosen the screw 5.
8. Loosen the nut 3.
9. Turn the nut 4 to set the distance between the 2 marks to 403.2 mm.
10. Tighten the nut 3.
11. Tighten the screw 4.

12. If the belt 2 is not at the center position, adjust the bolt 6 to make sure the belt 2 is at the center position.
13. Unlock the main switch.
14. Set the main switch to the position ON.

**Result** The belt tension is set.

### 7.9.4.2 Setting the Belt Tension (Rear Drafting System)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Loosen the nut at the pulley 2.

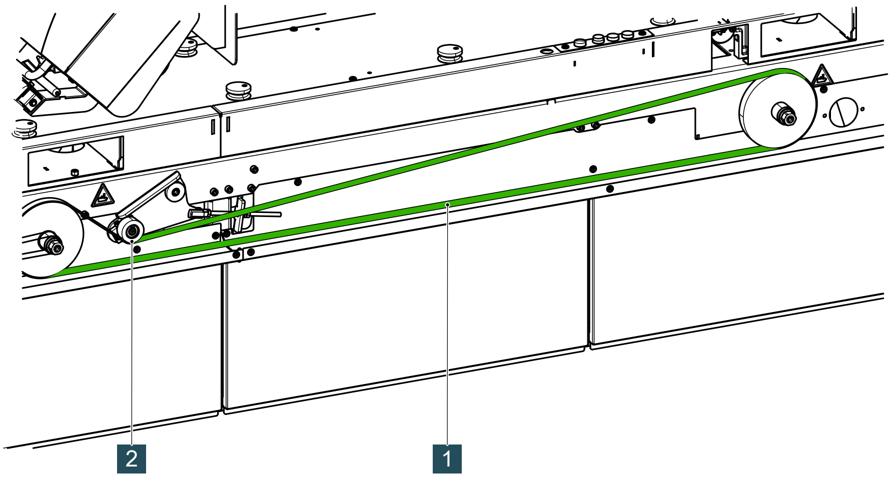


*Figure 217: Belt of the rear drafting system*

⇨ The belt 1 is loosened.

4. Remove the belt 1.
5. On the loosened belt 1, make 2 marks between which the distance is 1000 mm.
6. Loosen the nut 3.

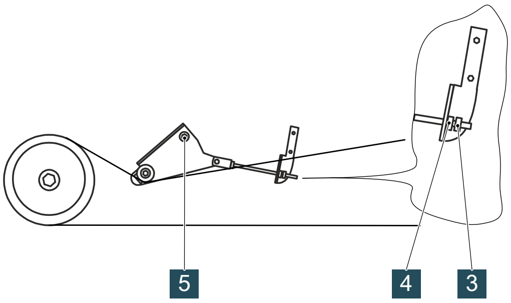


*Figure 218: Tensioning device of the belt*

7. Turn the nut 4 to set the distance between the 2 marks to 1006.5 mm.
8. Tighten the nut 3.
9. If the belt 1 is not at the center position, adjust the bolt 5 to set the belt 1 to the center position.
10. Unlock the main switch.
11. Set the main switch to the position ON.

**Result** The belt tension is set.

### 7.9.4.3 Setting the Belt to the Center of the Pulley

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Loosen the screw 1 at the pulley.

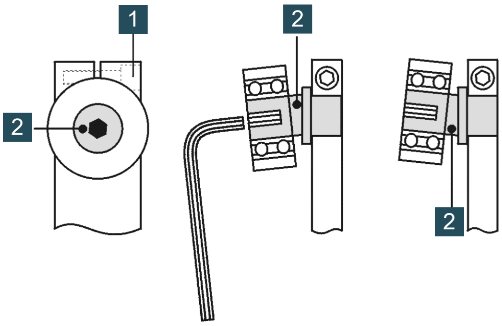


*Figure 219: Tension pulley of the longitudinal section*

4. Turn the bolt 2 until the distance A is the same as the distance B.

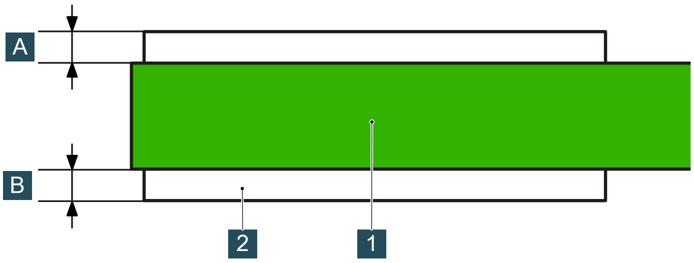


*Figure 220: Top view of the belt*

| | | | |
|---|---|---|---|
| 1 | The belt | 2 | The pulley |

5. Tighten the screw 1.

**Result** The belt is set to the center of the pulley.

### 7.9.4.4 Adjusting the Table Calender Guide

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Turn the pin 2 on the 2 sides of the table calender cylinder 3 to adjust the plate 1, and make sure that the table calender cylinder 3 has sufficient space to move up and down.
4. Adjust the plate 1 with turning the pin 2 on the 2 sides of the table calender cylinder 3 until the table calender cylinder 3 has sufficient space to move up and down.

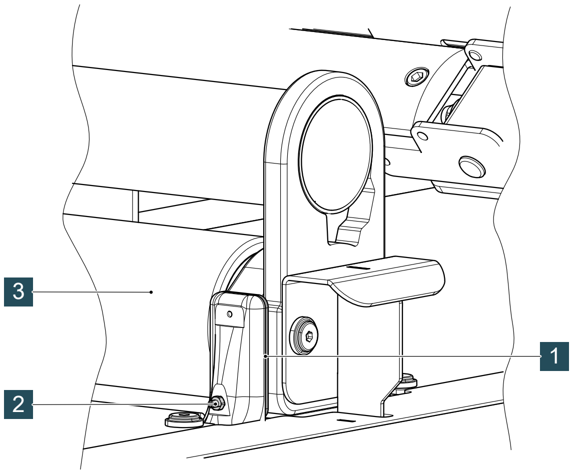


*Figure 221: Table calender guide*

⇨ The table calender cylinder 3 has sufficient space to move up and down.

5. Unlock the main switch.
6. Set the main switch to the position ON.

**Result** The table calender guide is adjusted.

### 7.9.4.5 Adjusting the Web Guides on the Web Table

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Turn the web guides 1 to adjust the web 2 until the web from the front drafting system is accurately on the web from the rear drafting system and make sure the web 2 is not turned over at the web guides 1.

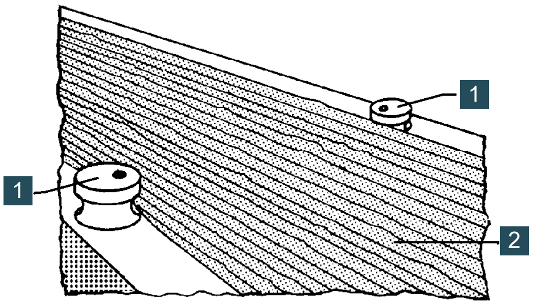


Figure 222: Web guides

4. Unlock the main switch.
5. Set the main switch to the position ON.

**Result** The web guides on the web table are adjusted.

### 7.9.4.6 Adjusting the Total Draft of the Drafting System

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

**WARNING**

**Moving belts**

Drive belts without covers cause injury to the hands.

▶ Do **NOT** touch the moving belts.

▶ Do adjustment only when the machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. **WARNING! Moving belts! Drive belts without covers cause injury to the hands.** Remove the cover at the drafting system pulleys on the left side.
4. Loosen the nuts at the pulleys 1 and 3.

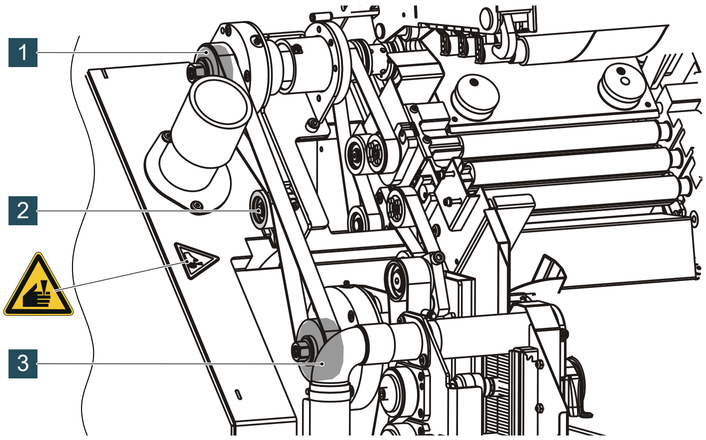


*Figure 223: Pulleys at the drafting system on the left side*

5. Turn the pulley 2 clockwise.
   - ⇨ The belt is loosened.
6. Remove the belt.
7. Remove the pulleys 1 and 3.
8. Install the new pulleys.
9. Install the belt.
10. Turn the pulley 2 counterclockwise.
    - ⇨ The belt is tightened.
11. Examine if the belt moves in the center position of the connected pulleys.
12. If the belt does not move in the center position of the connected pulley, adjust the belt.
13. Install the cover at the drafting system pulleys.
14. Unlock the main switch.
15. Set the main switch to the position ON.

**Result** The total draft of the drafting system is adjusted.

### 7.9.4.7 Adjusting the Break Draft of the Drafting System

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the cover at the drafting system pulleys on the right side.
4. Loosen the nuts at the pulley 1.

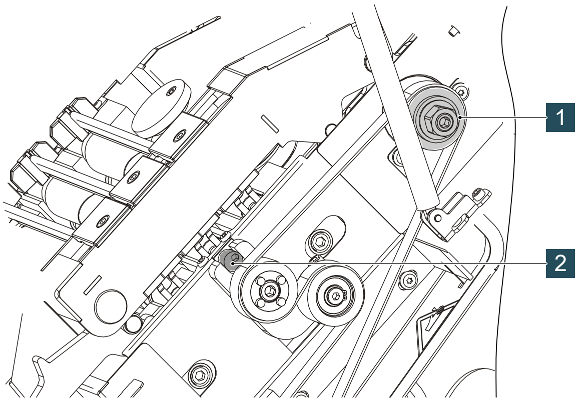


*Figure 224: Pulleys at the drafting system on the right side*

5. Turn the pulley 2 clockwise with a hexagonal key.
   - ⇨ The belt is loosened.
6. Remove the belt.
7. Remove the pulley 1.
8. Install the new pulley.
9. Install the belt.
10. Turn the pulley 2 counterclockwise.
    - ⇨ The belt is tightened.
11. Examine if the belt moves in the center position of the pulley.
12. If the belt does not move in the center position of the connected pulleys, adjust the belt.
13. Install the cover at the drafting system pulleys.
14. Unlock the main switch.
15. Set the main switch to the position ON.

**Result** The break draft of the drafting system is adjusted.

#### 7.9.4.8 Adjusting the Output Draft (V4)

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the cover at the pulleys that drive the main draft.
4. Loosen the nut 4.

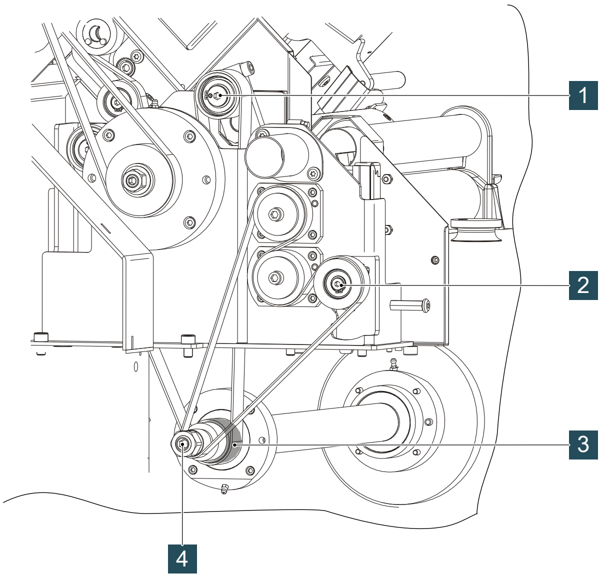


*Figure 225: Drafting system pulleys of the main draft*

5. Turn the pulley 2 clockwise.
   ⇨ The belt is loosened.
6. Turn the pulley 1 clockwise.
   ⇨ The belt is loosened.
7. Remove the belts.
8. Remove the pulley 3.
9. Install a new pulley 3.

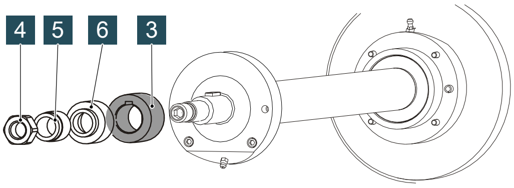


*Figure 226: Explosion of the drafting system pulleys of the main draft*

10. Install the sleeve 6.
11. Install the part 5.
12. Install the nut 4.
13. Install the belts.
14. Turn the pulley 2 counterclockwise.
    ⇨ The belt is tightened.
15. Turn the pulley 1 counterclockwise.
    ⇨ The belt is tightened.

16. Examine if the belt moves in the center position of the connected pulleys by the belt.
17. If the belt does not move in the center position of the pulley, adjust the belt.
18. Install the cover at the drafting system pulleys.
19. Unlock the main switch.
20. Set the main switch to the position ON.

**Result** The output draft (V4) of the drafting system is adjusted.

### 7.9.4.9 Examining the Draft Distances of the Drafting System

The bearing blocks that hold the bottom rollers in the drafting systems must follow the distance requirements in the table that follows:

| Staple Length (mm) | Nipping Line Distance (mm) | Bearing Block Distance (HVD) |
|---|---|---|
| 25.4 | 45 | 1 |
| 28.5 | 48 | 4 |
| 30.1 | 49 | 5 |
| 31.75 | 50 | 6 |
| 36.5 | 51 | 7 |

*Table 44:* Bearing block distances of the main draft

| Staple Length (mm) | Nipping Line Distance (mm) | Bearing Block Distance (HVD) (mm) |
|---|---|---|
| 25.4 | 42 | 0 |
| 28.5 | 45 | 3 |
| 30.1 | 46 | 4 |
| 31.75 | 47 | 5 |
| 36.5 | 48 | 6 |

*Table 45:* Bearing block distances of the break draft

All the values in the 2 tables above are applicable for cotton.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Measure the distance between the bearing saddles 1 and 2.

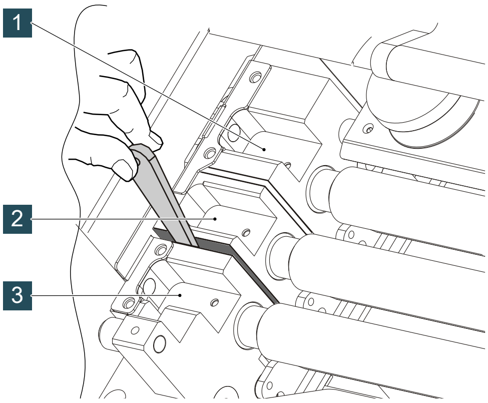


*Figure 227: Bearing saddles of the drafting system*

4. If the distance between the bearing saddles 1 and 2 is more than 0.1 mm larger than the target distance that is shown in the table Bearing block distances of the main draft, adjust the break draft distance.
5. Measure the distance between the bearing saddles 2 and 3.
6. If the distance between the bearing saddles 2 and 3 is more than 0.1 mm larger than the target distance that is shown in the table Bearing block distances of the break draft, adjust the main draft distance.
7. Unlock the main switch.
8. Set the main switch to the position ON.

**Result** The drafting distances of the drafting system are examined.

### 7.9.4.10 Setting the Main Draft Distance

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main draft distance is examined.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the cover of the drive system on the right side of the drafting system.
4. Turn the eccentric 1 on the right side of the drafting system with a hexagonal key.

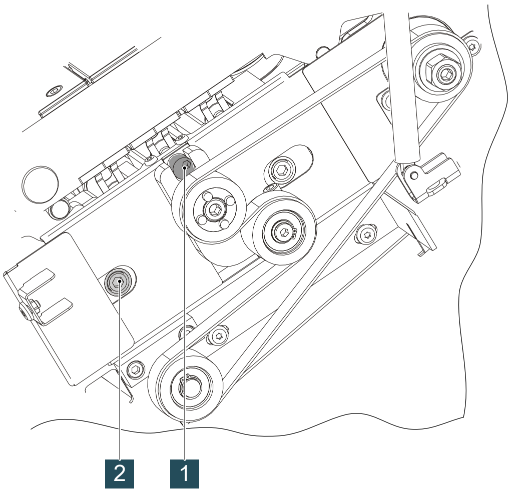


*Figure 228: Drive system of the drafting system on the right side*

⇨ The belt is loosened.

5. Loosen the screw 2.
6. Hit the screw 2 lightly.

⇨ The bearing blocks 4 and 5 on the right side of the drafting system are loosened with the shaft which connects the 2 bearing blocks.

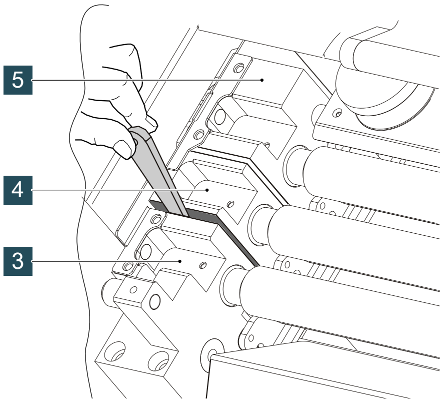


*Figure 229: Bearing housings of the drafting system*

7. Remove the cover of the drive system on the left side of the drafting system.
8. Turn the eccentric 7 on the left side of the drafting system with a hexagonal key.

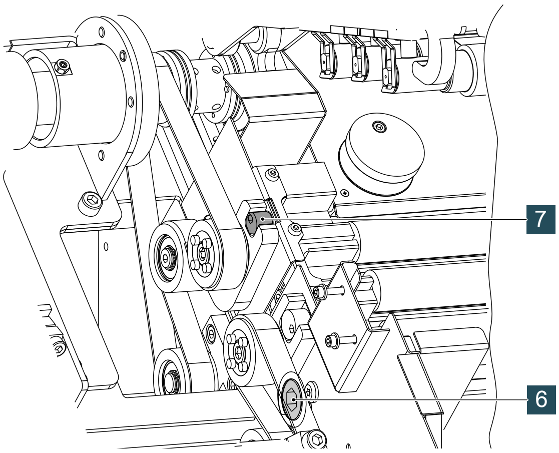


*Figure 230: Drive system of the drafting system on the left side*

⇨ The belt is loosened.

9. Loosen the screw 6.
10. Hit the screw 6 lightly.

⇨ The bearing blocks 4 and 5 on the left side of the drafting system are loosened with the shaft.

11. Measure the distance between the bearing blocks 3 and 4 on the 2 sides of the drafting system.
12. If the distance between the bearing blocks 3 and 4 is not the required value, move the bearing blocks 4 on the 2 sides to set the distance into the necessary value.
13. Make sure that the distance difference between the 2 bearing blocks 3 and 4 on the 2 sides are less or equal to 0.1 mm.
14. Tighten the screw 2.
15. Tighten the screw 6.
16. Tighten the belts on the 2 sides of the drafting system.
17. Install the 2 covers of the drive systems.

**Result** The main draft distance is set.

### 7.9.4.11 Setting the Break Draft Distance

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main draft distance is examined.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the cover of the drive system on the left side of the drafting system.

4. Turn the eccentric 1 on the left side of the drafting system with a hexagonal key.

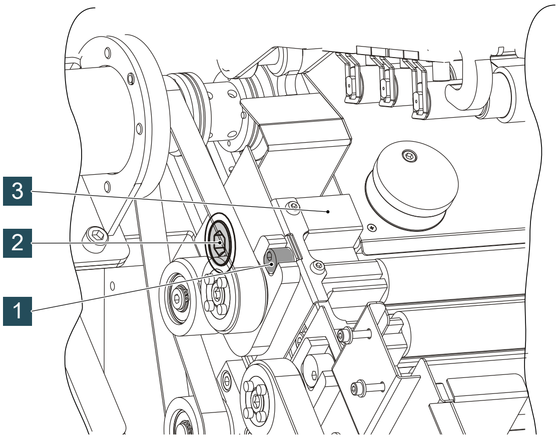


*Figure 231: Drive system of the drafting system on the left side*

⇨ The belt is loosened.

5. Loosen the screw 2.
6. Hit the screw 2 lightly.

⇨ The bearing blocks 3 on the left side of the drafting system is loosened.

7. Remove the cover of the drive system on the right side of the drafting system.
8. Turn the pulley 5 on the right side of the drafting system with a hexagonal key.

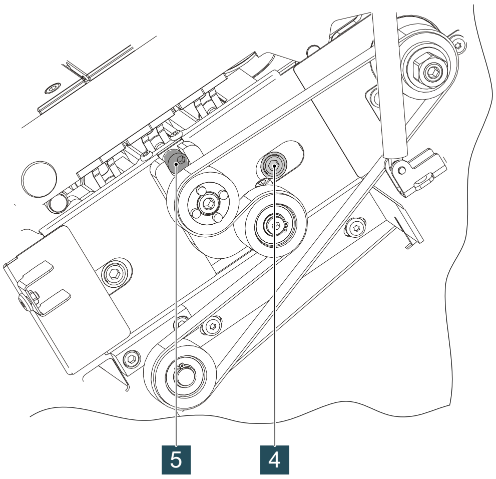


*Figure 232: Drive system of the drafting system on the right side*

⇨ The belt is loosened.

9. Loosen the screw 4.
10. Hit the screw 4 lightly.

⇨ The bearing block 3 on the right side of the drafting system is loosened.

11. Measure the distance between the bearing blocks 5 and 6.

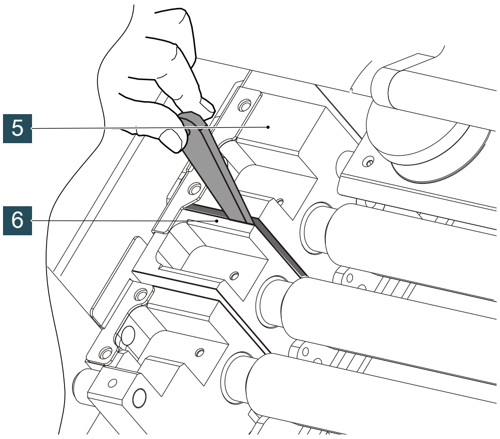


*Figure 233: The bearing blocks of the drafting system*

12. If the distance between the bearing blocks 5 and 6 is not the required value, move the 2 bearing blocks 5 on the 2 sides of the bottom roller to set the distance into the necessary value.
13. Make sure that the distances between the bearing block 5 and 6 on the 2 sides are parallel in the tolerance of less or equal to 0.1 mm.
14. Tighten the screw 2.
15. Tighten the screw 4.
16. Tighten the belts on the 2 sides of the drafting system.
17. Install the 2 removed covers of the drive systems.

**Result** The break draft is set.

### 7.9.4.12 Doing the Function Test of the Top Roller Sensors

**Prerequisites** Make sure that the criteria are obeyed:

✓ 2 persons are necessary to do the test.

1. Select **Service mode** in the data screen 80.1.
2. Select **End pos. long. part** in the field **Group:** in the data screen 81.1.
3. Select **Lap formation drafting system 1D1,U4** or **Lap formation drafting system 2D2,U4** in the field **Inputs:** in the data screen 81.1.
4. Move out the plunger 3.

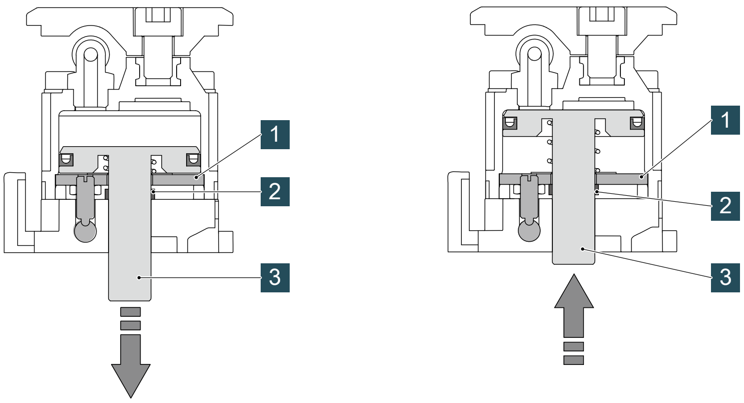


*Figure 234: Function test of the top roller sensors*

⇨ The contact ring 2 has no contact to the washer 1.

5. Examine if the field **State:** in the data screen 81.1 is 0.
6. Move in the plunger 3.

   ⇨ The contact ring 2 touches the washer 1.
7. Examine if the field **State:** in the data screen 81.1 is 1.
8. If the field **State:** in the data screen 81.1 is not correct, replace the loading elements and the seal for the loading elements.

**Result** The function test of the top roller sensor is done.

### 7.9.4.13 Grinding the Rubber Cots of the Top Rollers

The following special grinding disk is recommended for grinding the top roller cots:

| |
|---|
| Bubble disk V1481/2 (350 mm × 25 mm × 127 mm) |
| SIC 80 high precision |
| SIC 80 – H11 – V |

## WARNING

**Turning drafting system rollers!**

Danger of crushing the hands between the drafting system rollers when the drafting system is in operation

▶ Do NOT touch the area between the drafting system rollers.

1. **WARNING! Drafting system rollers! Danger of crushing the hands between the drafting system rollers when the drafting system is in operation.** Grind the rubber cots of the top rollers with the grinding disks recommended above.
2. When grinding the rubber cots, make sure that the cutting speed is 26 to 32 m/s.

3. When grinding the rubber cots, make sure that the top rollers turn 160 to 200 rpm counterclockwise.
4. When grinding the rubber cots, make sure that the feed speed is 400 to 500 mm/min.

**Result** The rubber cots of the top rollers are grinded.

### 7.9.4.14 Setting the Top Rollers

The top rollers are set to make sure that the top part of the drafting system opens and closes correctly. The top rollers are set by moving the loading elements.

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The break draft distance is set.
- ✓ The main draft distance is set.

1. Open the loading arm.

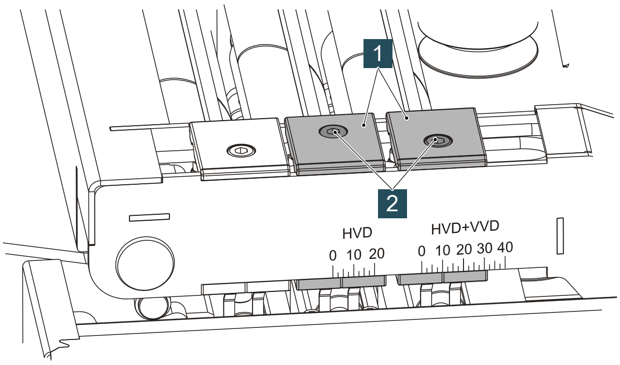


*Figure 235: Adjustment of the top rollers*

2. Loosen the bolts 2.
3. Move the loading elements 1 to set the scales.
4. Make sure that the scales for the top rollers are set to the equal value as the bottom rollers.
5. Tighten the bolts 2.

**Result** The top rollers are set.

### 7.9.4.15 Examining the Sliver Position between the Drafting Rollers

The operator must examine how the material is aligned in the cross section of the drafting system.

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is set to the position OFF and padlocked.

1. Push the stop button.
2. Open the loading arm.
3. Examine the position of the slivers.

4. Open the top part of the drafting system.
5. Examine the position of the slivers.
6. If the slivers are too far from each other as shown in the example B, adjust the sliver guides to decrease the web width.

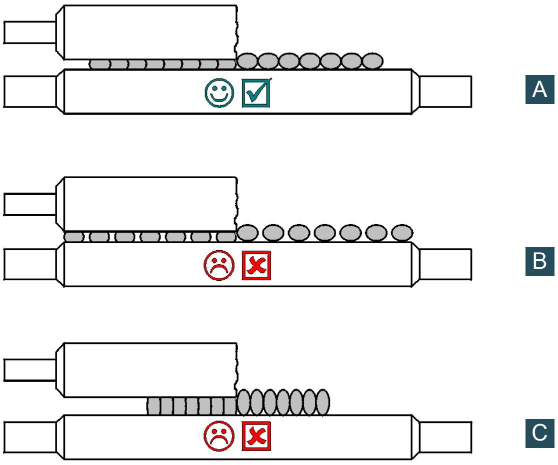


*Figure 236: Sliver position*

| | | | |
|---|---|---|---|
| A | Slivers are adjacent to each other. The setting is correct. | B | Slivers are too far from each other. The setting is incorrect. |
| C | Slivers are adjacent to each other too tightly. The setting is incorrect. | | |

7. If the web width is too small after the adjustment, increase the fiber mass.
8. If the slivers are adjacent to each other too tightly as in the example C, adjust the sliver guides to increase the web width.
9. If the web width becomes too large after the adjustment, decrease the fiber mass.

**Result** The sliver position between the drafting rollers is examined.

### 7.9.4.16 Adjusting the Sliver Guides and the Web Guides

1. Adjust the distance E until the slivers are adjacent to each other correctly as in the example A.

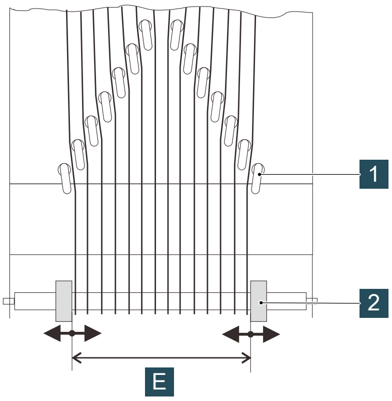


*Figure 237: Sliver guide*

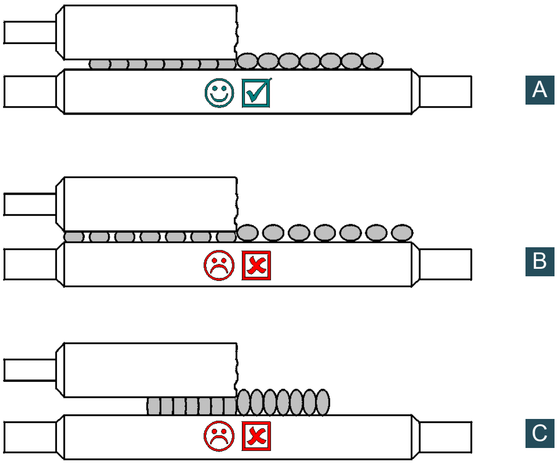


*Figure 238: Material configuration*

2. Decrease the distance E by 10 to 30 mm on the rear drafting system.
3. Increase the distance E by 10 to 30 mm on the front drafting system.
4. Adjust the sliver guides 1 until the slivers are in the same width as the distance E.
5. Make sure that the distance between each sliver guide 1 is the same.
6. Adjust the web guides 3 on the drafting system until the slivers are at a width equal to or smaller than the distance E.

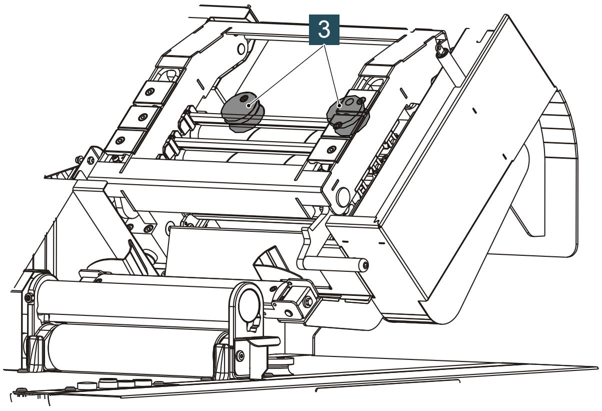


Figure 239: Web guides on the drafting system

**Result** The sliver guides and the web guides are adjusted.

### 7.9.4.17 Adjusting the Tension Bracket

**Prerequisites** Make sure that the criteria are obeyed:

✓ The sliver guides are adjusted.

1. Turn the screw 2 at the tension bracket 1 clockwise to decrease the web width.

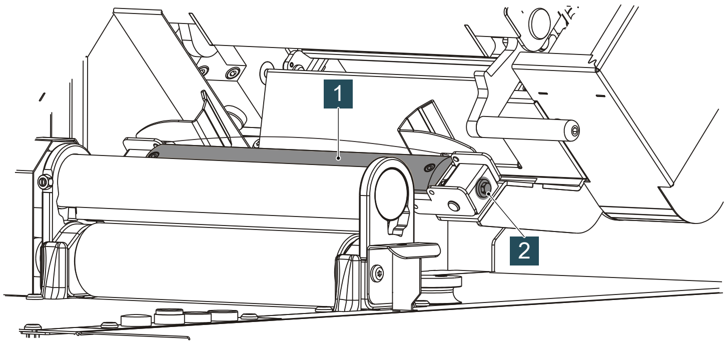


Figure 240: Tension brackets

2. Turn the screw 2 at the tension bracket 1 counterclockwise to increase the web width.
3. Make sure that the batt width in the lap head is 300 mm.

**Result** The tension bracket is adjusted.

### 7.9.4.18 Setting the Drafting System Suction

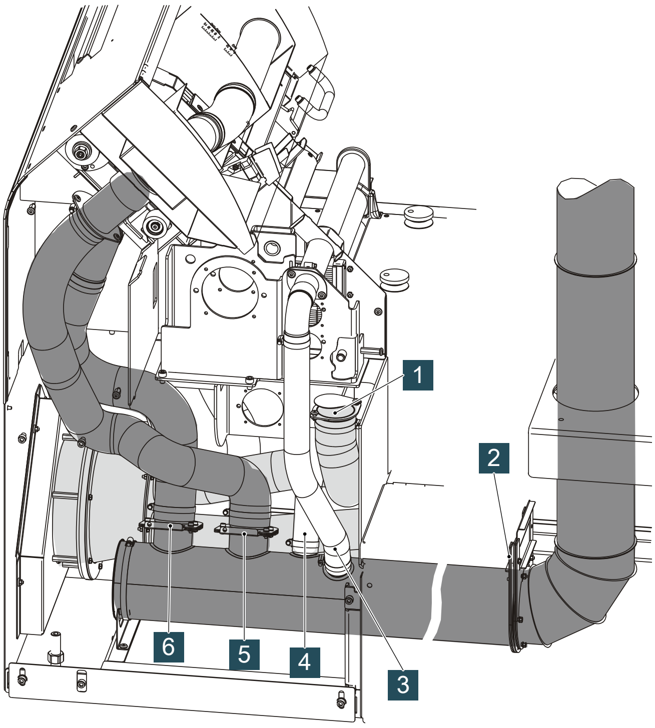


*Figure 241: Drafting system suction*

| | | | |
|---|---|---|---|
| 1 | Air supply for cleaning belt drives | 2 | Slider for the longitudinal section |
| 3 | Table calender at the top | 4 | Table calender at the bottom |
| 5 | Slider for the top drafting system | 6 | Slider for the bottom drafting system |

**Prerequisites** Make sure that the criteria are obeyed:

✓ The suction for the calender and lap winding spaces is set.
✓ The material is fully drawn in.
✓ A lap is in the lap head.

1. Close all the hoods and the doors.
2. Adjust the slider 2 to decrease the suction power as much as possible.
3. When adjusting the slider 2, make sure that the table calenders have sufficient vacuum available.
4. When adjusting the slider 2, make sure that the table calender suction is 80 to 90 mm.
5. Adjust the slider 5 and 6 to set the suction for the drafting system. Suction for the bottom drafting system and top drafting system: 40 mm.

**Result** The drafting system suction is set.

### 7.9.5 Creel

This section contains the information about the operation of the creel.

#### 7.9.5.1 Adjusting the Sliver Guides at the Creel

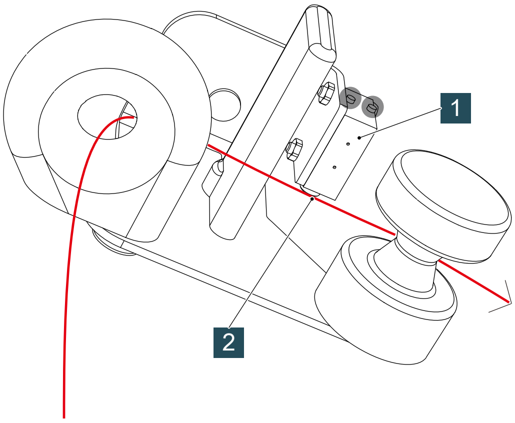


Figure 242: Sliver guide and sensor

This section contains the information about the function of the sliver guides and the adjustment of the sliver guides.

The sliver **2** is put through the ring. The sensor **1** monitors the sliver **2**. When the machine is at a standstill, the sensor **1** monitors if the sliver is available. If the sliver is not available, the machine does not start. When the machine is in operation, the sensor **1** monitors if the sliver moves. If the sliver does not move, the machine stops.

1. Adjust the screw **3** to set the height of the sliver guide element and make sure that the distance **S** is 10 mm.

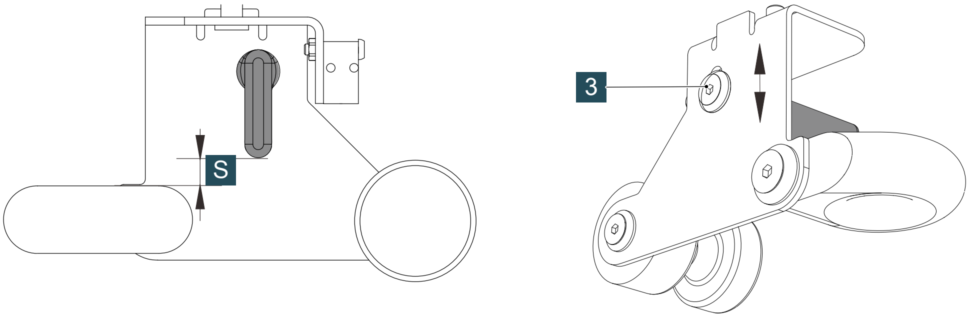


Figure 243: Adjustment of the sliver guides

**Result** The sliver guides at the creel are adjusted.

### 7.9.5.2 Connecting and Disconnecting the Sliver Breakage Monitor

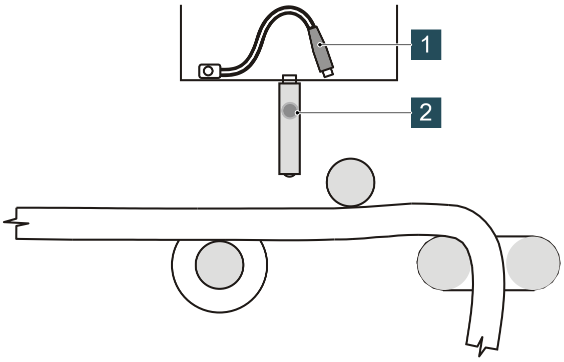


*Figure 244: Sliver breakage monitor*

#### Connecting the Sliver Breakage Monitor

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Attach the connector 1.
4. Set the main switch to the position ON.
   ⇨ The LED indicator 2 is on.

**Result** The sliver breakage monitor is connected.

#### Disconnecting the Sliver Breakage Monitor

1. Set the main switch to the position OFF.
2. Disconnect the connector 1.
3. Set the main switch to the position ON.
   ⇨ The LED indicator 2 is off.

**Result** The sliver breakage monitor is disconnected.

### 7.9.6 Electronic Devices

This section contains the information about the operation work of the control system.

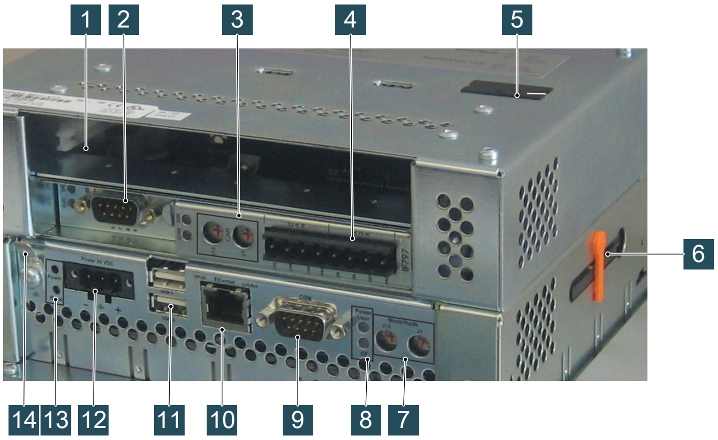


Figure 245: Basic module of the control system

| | | | |
|---|---|---|---|
| 1 | Additional module | 2 | COM interface for the belt serial logger |
| 3 | Address switch for interface module | 4 | Bus connector |
| 5 | Battery | 6 | CompactFlash card |
| 7 | Operating mode switch | 8 | LED of status |
| 9 | COM interface for MTBA | 10 | Ethernet port |
| 11 | USB ports | 12 | Power supply unit |
| 13 | Reset button and power supply button | 14 | Grounding clip |

### Additional Module

The additional module is not used in this machine.

### COM Interface for the Belt Serial Logger

This COM interface is the interface for the belt serial logger.

### Address Switch for Interface Module

The address switch for interface module is not used in this machine.

### Bus Connector

The bus connector has a CAN bus connector and a X2X bus connector.

### Battery

The battery keeps the data if the main switch is set to the position OFF.

### CompactFlash Card

The CompactFlash card has the machine software, and stays permanently in the operating unit.

### Operating Mode Switch

The operator can set the IP address of the SPIDERweb.

### LED Status

If the LED indicator is green, the power supply is correct.

### COM Interface for MTBA

This COM interface is the interface for MTBA and Rieter service functions (19200 8N1).

### Ethernet Port

This Ethernet port is from the communication lines with data system with higher level (SPIDERweb).

### USB Ports

The USB ports are the 2 ports of the USB host controller 2.0.

### Power Supply Unit

The power supply unit is internally fused. If the power supply unit is overloaded or connected incorrectly, the control system will not be damaged.

### Reset Button and Power Supply Button

The rest button and power supply button are only used for test. Do not push the keys.

### Grounding Clip

The control system is connected to the ground of the machine by the grounding clip.

## 7.9.6.1 Doing a Cold Start of the Controller

1. Push the reset button 1 with a pin.

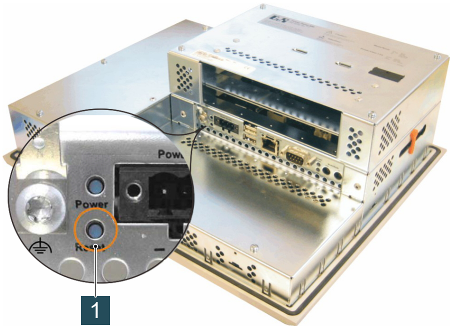


*Figure 246: Reset button*

⇨ A cold start is started.

⇨ All set values and data are set to default.

**Result** A cold start of the controller is done.

### 7.9.6.2 Setting the IP Address

The IP address is the communication address in the Ethernet network. The IP address can be set by the data screen or by the switches below.

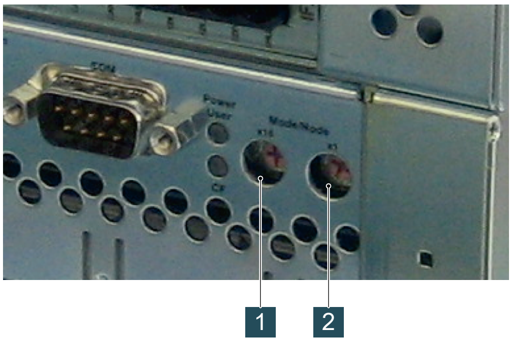
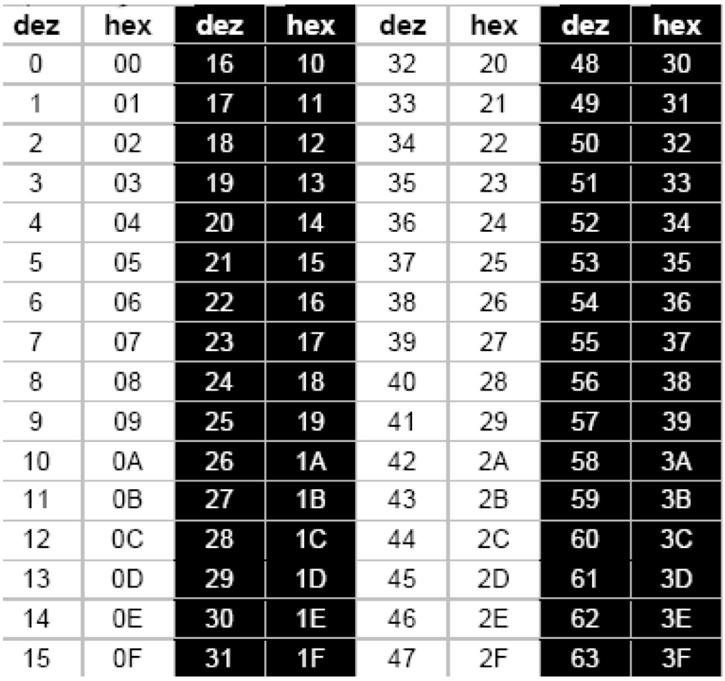


*Figure 247: Switches for IP address*

| | | | |
|---|---|---|---|
| 1 | Switch x16 | 2 | Switch x1 |

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Record the last 2 numbers of the IP address. For example, if the IP address is 172.27.10.21, the last 2 numbers are 21.
4. Refer to the figure that follows to change the last 2 decimal numbers to the hexadecimal numbers. For example, 21 is changed to 15.



| dez | hex | dez | hex | dez | hex | dez | hex |
|---|---|---|---|---|---|---|---|
| 0 | 00 | 16 | 10 | 32 | 20 | 48 | 30 |
| 1 | 01 | 17 | 11 | 33 | 21 | 49 | 31 |
| 2 | 02 | 18 | 12 | 34 | 22 | 50 | 32 |
| 3 | 03 | 19 | 13 | 35 | 23 | 51 | 33 |
| 4 | 04 | 20 | 14 | 36 | 24 | 52 | 34 |
| 5 | 05 | 21 | 15 | 37 | 25 | 53 | 35 |
| 6 | 06 | 22 | 16 | 38 | 26 | 54 | 36 |
| 7 | 07 | 23 | 17 | 39 | 27 | 55 | 37 |
| 8 | 08 | 24 | 18 | 40 | 28 | 56 | 38 |
| 9 | 09 | 25 | 19 | 41 | 29 | 57 | 39 |
| 10 | 0A | 26 | 1A | 42 | 2A | 58 | 3A |
| 11 | 0B | 27 | 1B | 43 | 2B | 59 | 3B |
| 12 | 0C | 28 | 1C | 44 | 2C | 60 | 3C |
| 13 | 0D | 29 | 1D | 45 | 2D | 61 | 3D |
| 14 | 0E | 30 | 1E | 46 | 2E | 62 | 3E |
| 15 | 0F | 31 | 1F | 47 | 2F | 63 | 3F |

*Figure 248: DEZ and HEX*

5. Set the switch x1 2 to the last hexadecimal number. For example, set the switch x1 to the position 5.
6. Set the switch x16 1 to the second-last hexadecimal number. For example, set the switch x16 to the position 1.
7. Unlock the main switch.
8. Set the main switch to the position ON.
9. Examine the IP address in the data screen 41.1.

**Result** The IP address is set.

### 7.9.6.3 Examining the Step Motor Card

The 2 LED indicators at the step motor card are the signals for the operator to find the cause of the fault.

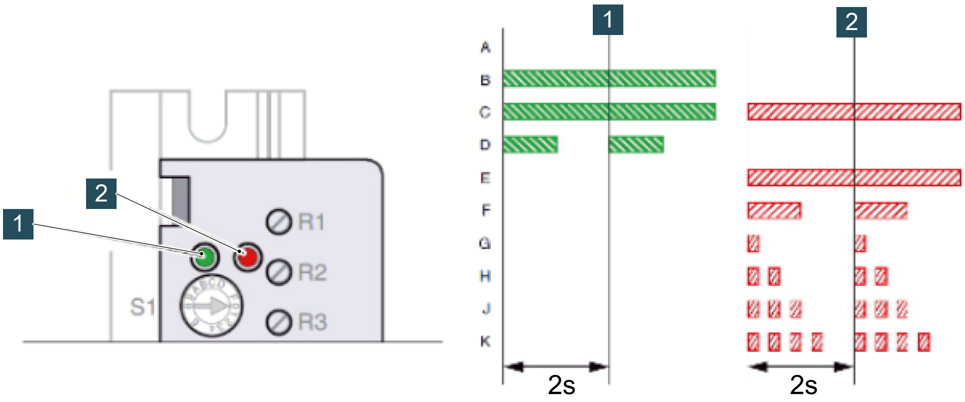


*Figure 249: Step motor card*

|  |  |  |  |
|---|---|---|---|
| 1 | LED OK | 2 | LED ERR |
| A | No supply at the end phase | B | End phase is released |
| D | End phase is stopped | F | Unwanted temperature at the end phase |
| G | Unwanted voltage, including in the regeneration condition | H | Low voltage |
| J | Frequency of external reference value too high | K | Short circuit between 2 motor phase |

The A – K represent the causes of the fault. The bars in the figure are the status of the 2 LEDs. For example, if the LED 1 and the LED 2 are off, then the cause of the fault is that there is no supply at the end phase.

### 7.9.7 Pneumatic Unit

The pneumatic unit in the lap head is shown in the figure that follows.

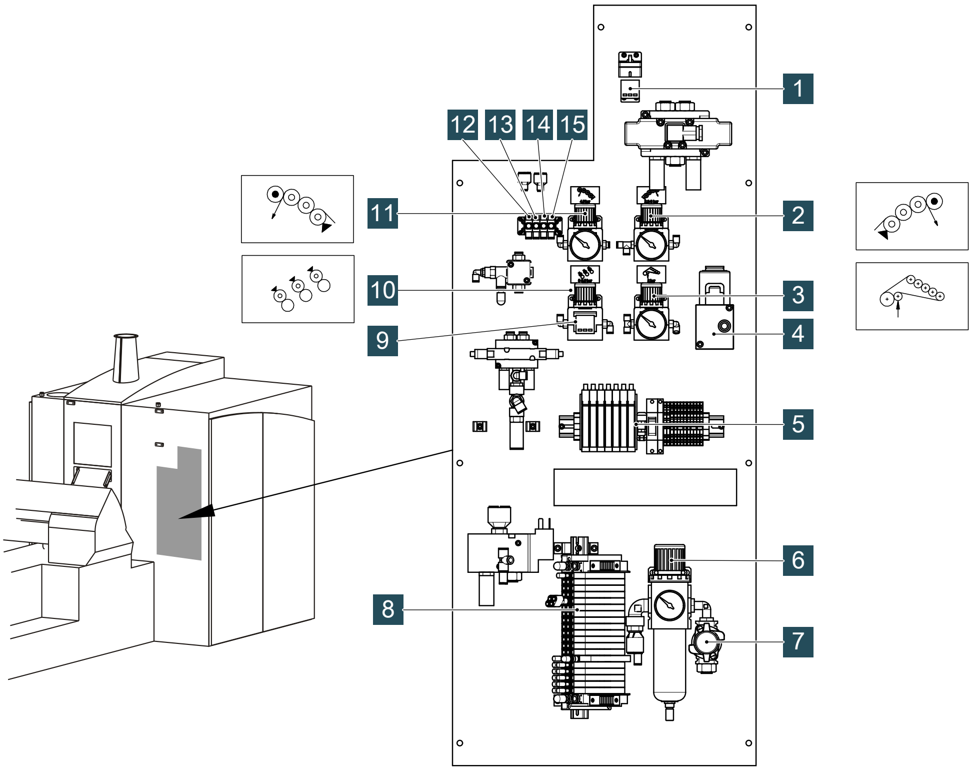


*Figure 250: Pneumatic unit*

| | | | |
|---|---|---|---|
| 1 | Monitor of the vacuum suction (S71) | 2 | Pressure regulator of the calender rollers, left side of the machine |
| 3 | Pressure regulator of the tension pulley at the calender drive | 4 | Pressure regulating valve of the tension unit (Y82) |
| 5 | X20 PLC I/O Interface | 6 | Main pressure regulator (Z0) |
| 7 | Main compressed – air valve | 8 | Solenoid valves |
| 9 | Monitor of the drafting system load (S72) | 10 | Regulator of the drafting system load |
| 11 | Pressure regulator of the calender rollers, right side of the machine | 12 | Outlet throttle for adjusting the lifting speed of the detaching flap |
| 13 | Outlet throttle for adjusting the lowering speed of the detaching flap | 14 | Inlet throttle for adjusting the top roller load of the drafting system |
| 15 | Inlet throttle for adjusting the belt pulley load at the calender drive | | |

### 7.9.7.1 Starting the Manual Control of a Solenoid Valves

1. Refer to the electrical manual to find the button for the solenoid valve for the correct function.
2. Push the button 1 with a nib.

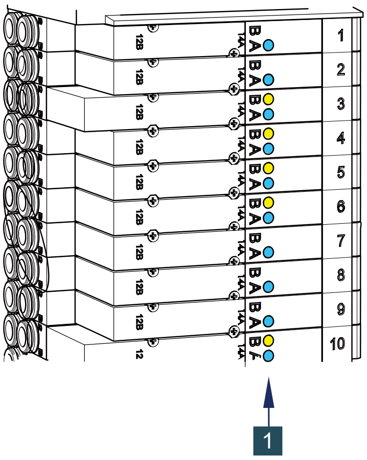


*Figure 251: Solenoid valves*

3. Hold the button 1.
   - ⇨ The valve changes.
4. Release the button 1.
   - ⇨ The valve changes to the initial condition.

**Result** The manual control of a solenoid valve is started.

### 7.9.7.2 Examining the Pressure Regulating Valve with the LED indicators

The pressure regulating valve has 2 LED indicators. The LED indicator 1 shows the pressure status. The LED indicator 2 shows the voltage status.

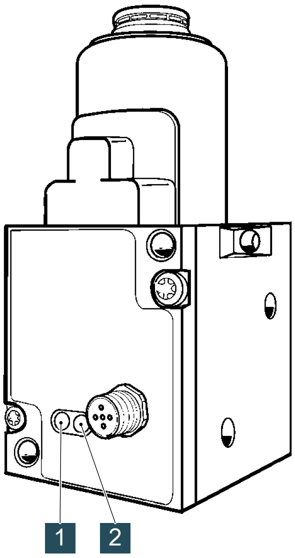


*Figure 252: LED indicators of the pressure regulating valve*

The operator can refer to the table that follows to know the explanation of the LED indicator status, the causes, and the remedies. Then the operator knows how to examine the pressure regulating valve with the LED indicators.

| Status | Cause | Remedy |
|---|---|---|
| The LED indicator 1 is green. | The LED indicator 1 is in the range of the pressure regulating valve. | -- |
| The LED indicator 1 is off | The nominal value is 0. | Examine the signal voltage of the pressure regulating valve. |
| The LED indicator 1 flashes green | The LED indicator 1 is out of the range of the pressure regulating valve. | Compare the actual value of the pressure with the nominal value of the pressure. YU |
| The LED indicator 2 is green. | The pressure regulating valve is ready for operation. | -- |
| The LED indicator 2 is off | The pressure regulating valve does not have voltage supply. | Examine if the pressure regulating valve has the voltage supply.YU |
| The LED indicator 2 flashes green | The voltage that is given to the pressure regulating valve is not sufficient. | Examine the signal voltage of the pressure regulating valve.YU |

*Table 46:* The status of the LED indicators

### 7.9.7.3 Examining the Signal Voltage of the Pressure Regulating Valve

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.

1. Examine the nominal voltage value of the pressure regulating valve 1 on the data screen 30.5.

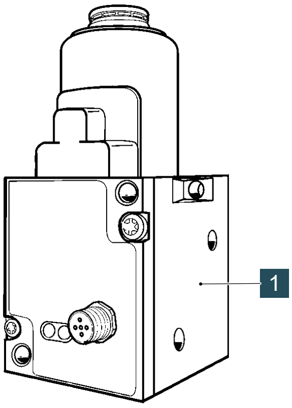


*Figure 253: Pressure regulating valve*

2. Examine the actual voltage value of the pressure regulating valve 1 on the data screen 30.6.
3. Measure the actual voltage value and the nominal voltage value of the pressure regulating valve 1 with the voltmeter in accordance with the electrical document.
4. Compare the measured voltage values with the shown voltage values.
5. If the measured values are not the same with the shown values, examine the shield and the plug connections.
6. Replace the defective parts if necessary.

**Result** The signal voltage of the pressure regulating valve is examined.

### 7.9.7.4 Setting the Main Pneumatic Pressure

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.

1. Set the handle 3 in the vertical direction to open the main compressed-air valve.

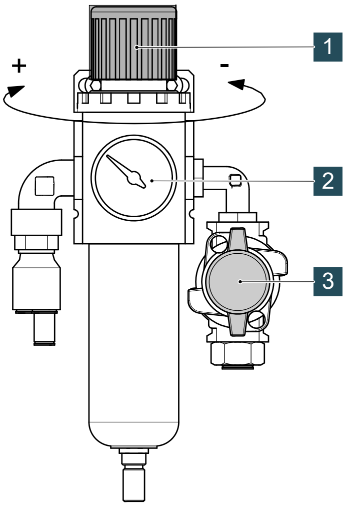


*Figure 254: The main compressed-air valve*

2. Move up the main pressure regulator 1 to unlock the compressed-air valve.
3. Turn the main pressure regulator 1 to set the compressed-air pressure to 7 bars in accordance with the value shown on the manometer 2.
4. Move down the main pressure regulator 1 to lock the compressed-air valve.
5. If the operator cannot adjust the compressed-air pressure to 7 bars, examine the supplied compressed-air to the main compressed-air valve.

**Result** The main pneumatic pressure is set.

### 7.9.7.5 Examining the Pressure Value of the Tension Unit Cylinder

1. Push the stop button when a lap in the machine is in operation.
2. Examine if the actual value of the supplied pressure to the tension unit cylinder is the same with the nominal pressure value.
3. Measure the actual pressure supplied to the tension unit cylinder with a manometer.
4. Get the nominal pressure value from the **Contact-pressure curve** on the data screen 12.2 (*refer to ▸ 119*).
5. If the outlet pressure value of the tension unit cylinder is not the same with the nominal pressure value, examine the pressure regulating valve 1 and all the air lines on the tension unit cylinder for the pressure loss.

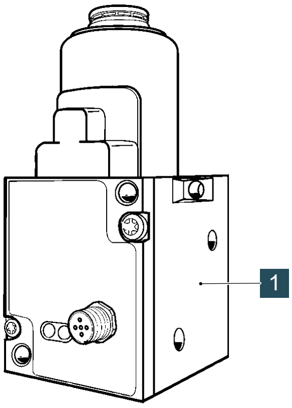


*Figure 255: Pressure regulating valve*

6. If the pressure loss is found, repair the pressure loss.
7. If the pressure loss is repaired or no pressure loss is found, but the pressure value of the tension unit cylinder is also not the same with the nominal pressure value, do the step 8, replace the pressure regulating valve 1.

**Result** The pressure value of the tension unit cylinder is examined.

### 7.9.7.6 Setting the Pressure of the Tension Lever Roller

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main pneumatic pressure is set.

1. Set the pressure value of the cylinder that controls the tension lever roller 1 to the range of 2.9 bar to 5.9 bar (more pressure for a small laps, less pressure for a large laps).

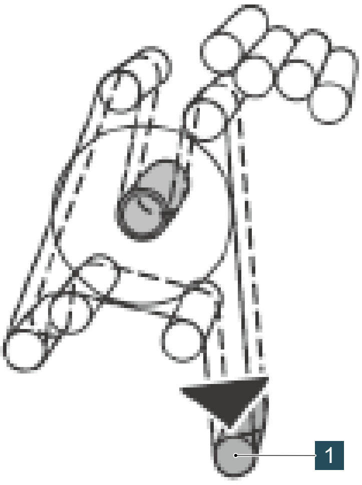


*Figure 256: Tension lever roller*

2. Set the values of **Contact-pressure curve** in the data screen 12.2 (*refer to ▶ 119*).
3. Examine if the diameter of the produced lap is less than or equal to 580 mm.
4. Examine if the lap drift and the hairiness of the produced lap are low.
   ⇨ If the produced lap follows the requirements that are in the step 3 and step 4, then the lap quality is approved.

**Result** The pressure of the tension lever roller is set.

### 7.9.7.7 Setting the Pressure of the Tension Pulley in the Lap Head

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main pneumatic pressure is set.

1. Find the pressure regulating valve that controls the tension pulley 1 at the calender drive in accordance with the pneumatic unit introduction.

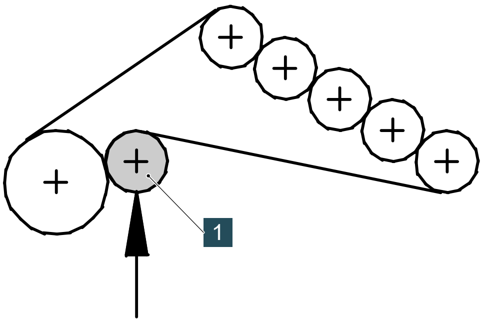


*Figure 257: Tension pulley*

2. Move up the pressure regulator 2 to unlock the compressed-air valve.

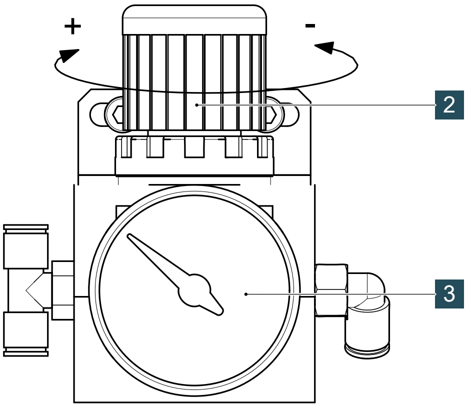


*Figure 258: Pressure regulating valve*

3. Turn the pressure regulator 2 to set the compressed-air pressure to 2 bars in accordance with the value shown on the manometer 3.
4. Move down the pressure regulator 2 to lock the compressed-air valve.

**Result** The pressure of the tension pulley in the lap head is set.

### 7.9.7.8 Setting the Calender Load of the Lap Head

Because the actual load of the calender rollers at the left side is affected by the toothed belt, the pressure of the calender rollers at the left side must be set lower than the pressure at the right side.

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main pneumatic pressure is set.

1. Find the pressure regulator of the calender rollers 1 at the right side in accordance with the pneumatic unit introduction.

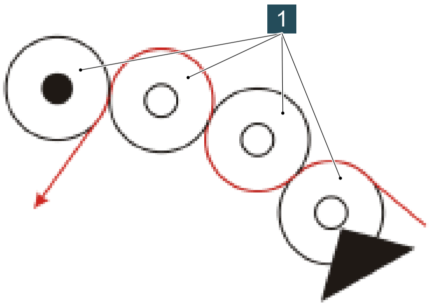


*Figure 259: Calender rollers*

2. Move up the pressure regulator 2 to unlock the compressed-air valve.

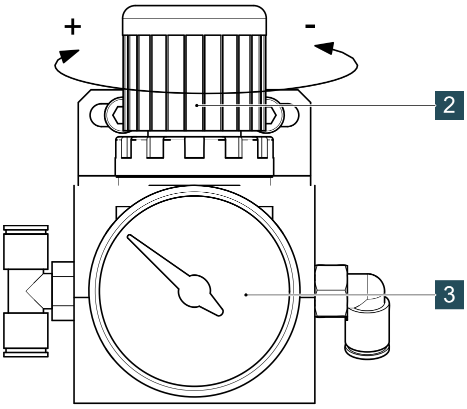


*Figure 260: Pressure regulating valve*

3. Turn the pressure regulator 2 to set the compressed-air pressure to 4.5 bars in accordance with the value shown on the manometer 3.
4. Move down the pressure regulator 2 to lock the compressed-air valve.
5. Find the pressure regulator of the calender rollers at the left side in accordance with the pneumatic unit introduction.
6. Move up the pressure regulator 2 to unlock the compressed-air valve.

7. Turn the pressure regulator 2 to set the compressed-air pressure in the range of 2 bars to 3 bars in accordance with the value shown on the manometer 3.
8. Move down the pressure regulator 2 to lock the compressed-air valve.

**Result** The calender load of the lap head is set.

### 7.9.7.9 Setting the Pressure of the Lap Disks

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main pneumatic pressure is set.
- ✓ Find the pressure regulating valve that controls the pressure of the lap disks 3.

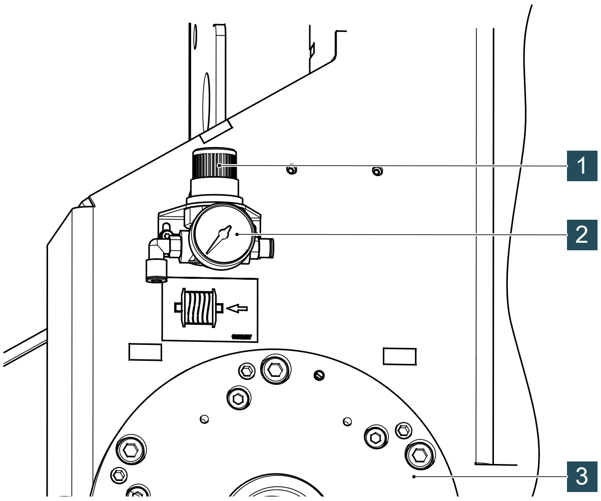


*Figure 261: Pressure regulating valve of the lap disks*

1. Move up the pressure regulator 1 to unlock the compressed-air valve.
2. Turn the pressure regulator 1 to set the compressed-air pressure to 5.5 bars in accordance with the value shown on the manometer 2.
3. Move down the pressure regulator 1 to lock the compressed-air valve.

**Result** The pressure of the lap disks is set.

### 7.9.7.10 Setting the Drafting System Load

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main pneumatic pressure is set.

1. Find the pressure regulating valve 2 that controls the rollers 1 of the drafting system in accordance with the pneumatic unit introduction.

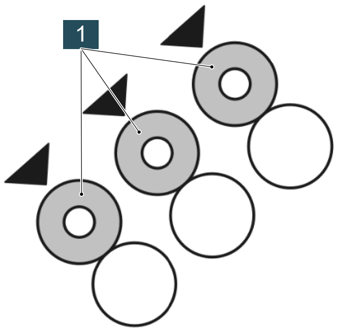


Figure 262: Rollers of the drafting system

2. Move up the pressure regulator 2 to unlock the compressed-air valve.

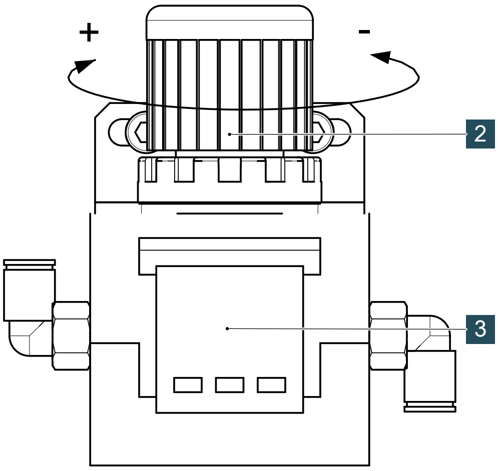


Figure 263: Pressure regulating valve of the drafting system

3. Turn the pressure regulator 2 to set the compressed-air in accordance with the value shown on the manometer 3.
4. Move down the pressure regulator 2 to lock the compressed-air valve.

**Result** The drafting system load is set.

### 7.9.7.11 Setting the Pressure Monitor of the Drafting System

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main pneumatic pressure is set.
- ✓ The measured pressure of the drafting system is not sufficient.

1. Set the main switch to the position OFF.
2. Turn the main switch to the position ON.

   ⇨ The screen on the pressure monitor S72 shows a value of 0.00 or other value.

3. Tap and hold the key 3 for 5 seconds.

   ⇨ The value F0 is flashing.

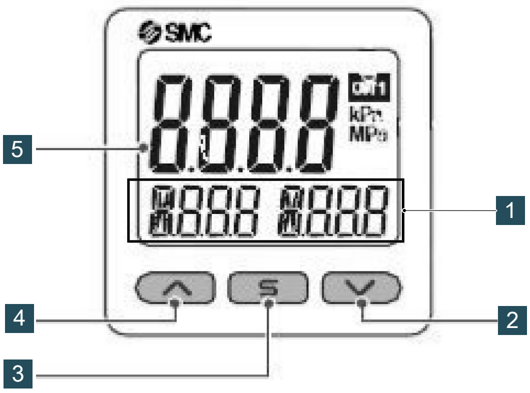


*Figure 264: Pressure monitor of the drafting system (S72)*

4. Tap the key 3.

   ⇨ A code is shown in the field 1.

5. Tap the key 2 until the code 6 is shown in the field 1.

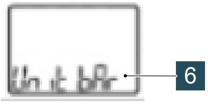


*Figure 265: The code 6 of the pressure monitor*

6. Tap the key 3.

   ⇨ The value F0 flashes to show that the value is set.

7. Tap the key 4.

   ⇨ The value F1 flashes.

8. Tap the key 3.

   ⇨ A code is shown in the field 1.

9. Tap the key 2 until the code 7 is shown in the field 1.

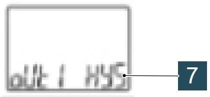


*Figure 266: The code 7 of the pressure monitor*

10. Tap the key 3.

    ⇨ A different code is shown in the field 1.

11. Tap the key 2 until the code 8 is shown in the field 1.

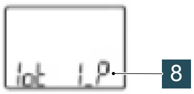


*Figure 267: The code 8 of the pressure monitor*

12. Tap the key 3.
    ⇨ A different code is shown in the field 1.
13. Tap the keys 2 and 4 to set the value in the field 9 to 4.500.

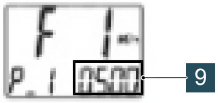


*Figure 268: The display of the pressure monitor*

14. Tap the key 3.
    ⇨ A different code is shown in the field 1.
15. Tap the keys 2 and 4 to set the value in the field 6 to 0.500.
16. Tap the key 3.
    ⇨ A different code is shown in the field 1.
17. Tap the keys 2 and 4 to set the value in the field 6 to 1.
18. Tap the key 3.
    ⇨ A different code is shown in the field 1.
19. Tap the key 2 until the code 10 is shown in the field 1.

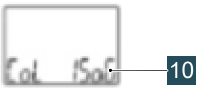


*Figure 269: The code 10 of the pressure monitor*

20. Tap the key 3.
    ⇨ The code F1 flashes to show that the code is set.
21. Tap and hold the key 3 for 2 seconds.

**Result** The pressure monitor of the drafting system is set.

### 7.9.7.12 Setting the Vacuum Monitor of the Vacuum Suction

The procedure has the information about the adjustment of the vacuum monitor for the vacuum suction.

## Setting the Start Parameter

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main pneumatic pressure is set.
- ✓ The measured vacuum pressure of the drafting system is not sufficient.

1. Set the vacuum suction for the calender rollers and the lap compression.
2. Decrease the vacuum suction of the calender rollers.
3. Set the main switch to the position OFF.
4. Set the main switch to the position ON.
5. The screen on the pressure monitor S71 shows a value of 0.00 or other value.
6. Tap and hold the key 2 for 3 seconds.

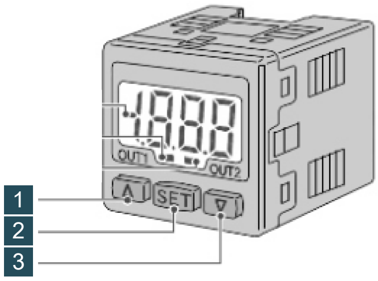


*Figure 270: Vacuum monitor of the vacuum suction (S71)*

⇨ A code is shown in the data screen of the vacuum monitor S71.

7. Tap the key 3 until the code 4 is shown.

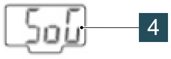


*Figure 271: The code 1 of the vacuum monitor*

8. Tap the key 2.

⇨ A new code is shown.

9. Tap the key 3 until the code 5 is shown.

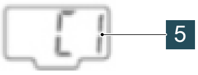


*Figure 272: The code 2 of the vacuum monitor*

10. Tap the key 2.

⇨ A new code is shown.

11. Tap the key 3 until the code 6 is shown.

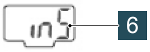


*Figure 273: The code 3 of the vacuum monitor*

12. Tap the key 2.
    ⇨ A new code is shown.
13. Tap the key 3 until the code 7 is shown.

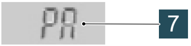


*Figure 274: The code 4 of the vacuum monitor*

14. Tap the key 2.
    ⇨ A new code is shown.
15. Tap the key 3 until the code 8 is shown.

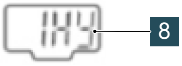


*Figure 275: The code 5 of the vacuum monitor*

16. Tap the key 2.
    ⇨ A new code is shown.
17. Tap the key 3 until the code 9 is shown.

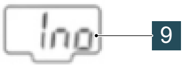


*Figure 276: The code 6 of the vacuum monitor*

18. Tap the key 2.
    ⇨ A new code is shown.
19. Tap the key 3 until the code 10 is shown.

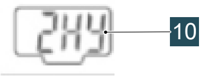


*Figure 277: The code 7 of the vacuum monitor*

20. Tap the key 2.
    ⇨ A new code is shown.
21. Tap the key 3 until the code 11 is shown.

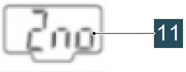


*Figure 278: The code 8 of the vacuum monitor*

22. Tap the key 2.

    ⇨ A new code is shown.

23. Tap the key 3 until the code 12 is shown.

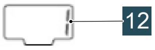


*Figure 279: The code 9 of the vacuum monitor*

24. Tap the key 2.

    ⇨ A new code is shown.

25. Tap the key 3 until the code 13 is shown.

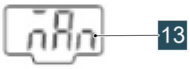


*Figure 280: The code 10 of the vacuum monitor*

26. Tap the key 2.

    ⇨ The data screen shows a value of 0.00 or other value.

**Result** The start parameter is set.

### Setting the Switch Point

| Switch Point | |
|---|---|
| In Pascal | -600 Pa |
| In mm (water column height) | 600 mm (WCH) |

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The main pneumatic pressure is set.
- ✓ The measured vacuum pressure of the drafting system is not sufficient.

1. Set the vacuum suction of the calender rollers and the lap compression.
2. Decrease the vacuum suction for the calender rollers.
3. Set the main switch to the position OFF.
4. Set the main switch to the position ON.

   ⇨ The screen on the pressure monitor S71 shows a value of 0.00 or other value.

5. Tap the key 2.

   ⇨ The code 15 and the value 14 are shown in turn.

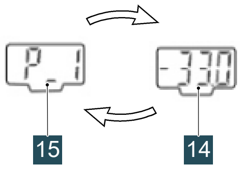


*Figure 281: The data screen change*

6. Tap the keys 1 and 3 to set the value to -0.60.
7. Tap the key 2.
   ⇨ The code H_1 is shown.
8. Tap the keys 1 and 3 to set the code H_1 to 000.
9. Tap the key 2.
   ⇨ The code P_3 is shown.
10. Tap the keys 1 and 3 to set the code P_3 to 000.
11. Tap the key 2.
    ⇨ The code H_2 is shown.
12. Tap the keys 1 and 3 to set the code H_2 to 000.
13. Tap the key 2.
    ⇨ The data screen shows a value of 0.00 or other value.

**Result** The switch point is set.

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# 8 Troubleshooting

This chapter contains information about fault causes and remedies for:

- Faults that have fault codes
- Faults that do not have fault codes
- Material-specific faults

More information about the electric devices and pneumatic devices is to be found in the electrical documentation.

## 8.1 Troubleshooting Personnel

Only Rieter-approved personnel are permitted to do troubleshooting work at the machine.

## 8.2 About the Fault Message Lists

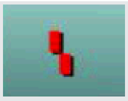
All faults with fault codes that are shown on the operating unit are recorded in a numbered fault message list.

The fault message list helps to correct faults that occur during machine operation.

The fault message list contains 4 columns. The columns contain the information that follows:

| Table Header | Explanation |
|---|---|
| Fault code | The fault code is the number to identify a fault. |
| Fault text | The fault text gives a short description of the fault. |
| Fault cause | The fault cause shows the condition that started the fault. 1 cause or more causes are possible. |
| Remedy | The remedy shows alternatives on how to correct the fault. |

The machine shows different alarm levels on the operating unit. Different alarm levels cause different machine reactions.

| Alarm Level | Fault Icon | Impact on the Production | Explanation |
|---|---|---|---|
| Alarm |  | The production stops. | An alarm immediately stops the production. An operator intervention is necessary.<br>The production is not possible to be started until the fault is repaired.<br>The signal lamp is on. |

| Alarm Level | Fault Icon | Impact on the Production | Explanation |
|---|---|---|---|
| Warning message | ⚠ | The production continues, but the output is possible to be decreased. | The production does not immediately decrease. An operator intervention must come after immediately to prevent that the production decreases or stops.<br>The signal lamp is off or flashes in relation to the fault cause.<br>A warning message can always become an alarm. |
| Maintenance warning | 🚶 | The production continues. | A maintenance warning tells the maintenance personnel to do specified work at the machine.<br>The maintenance warnings are caused by software that monitors the machine units.<br>The 2 types of maintenance warnings are:<br>– Do the maintenance immediately. Get maintenance personnel in less than a day.<br>– Do the maintenance during the next timed maintenance interval.<br>The signal lamp flashes.<br>A maintenance warning can always become an alarm. |

Data in curly parentheses {…} are placeholders for a number or a text in the fault message that is adapted to the situation.

## 8.3 Faults with Fault Code

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 128 | Lapposition ocupied! | The lap position is occupied. | – Remove the lap.<br>– Examine the sensor. |
| 130 | SERVOtrolley: No trolley present! | The sensor does not sense a trolley. | – Put the trolley.<br>– Examine the sensor. |
| 135 | Belt control not calibrated | Belt control | Adjust the belt control (*refer to ▸ 190*). |
| 137 | SERVOlap not ready | SERVOlap | Make sure the SERVOlap is ready. |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 138 | Cross conveyor blocked | There is a manual lap ejection by OMEGAlap | Remove the lap. |
| 200 | Temperature main motor too high | Overload, mechanical cause. For example, incorrect fiber lap formation at a turning part, defective bearing | Find the defective elements and replace the defective elements if necessary. |
| | | Lap belt touches with a lap disk. | – Examine the operation of the belt run during the lap build-up (*refer to ▸ 179*).<br>– Visually examining the operating position of the lap belt (*refer to ▸ 329*). |
| | | Blockage prevents the correct airflow. | Clean the fan wheel on the main motor (*refer to ▸ 307*). |
| 201 | Temperature frequency converter too high | Overload, mechanical cause. For example, incorrect fiber lap formation at a turning part, defective bearing | Find the defective elements and replace the defective elements if necessary. |
| | | There is a temporary overload. | Let the frequency converter to cool off. Increase the air exchange by opening the doors and the covers. |
| | | Temperature sensor is defective. | Replace the temperature sensor. |
| 202 | Catch-all error frequency converter! | There is an internal fault | Read documentation from the supplier. |
| 204 | CAN bus communication disturbed | Communication with the frequency converter is stopped. | Examine the CAN cabling and the frequency converter. |
| | | The plug connection of the CAN bus is not correct. | Disconnect the CAN bus connector. Put the CAN bus connector correctly. |
| | | Terminators are not installed correctly. | Examine the terminators regarding the circuit diagram. |
| 205 | Motor protection switch triggered QU1,QG1,Q4,Q5 | Frequency converter QU1 | – Examine the frequency converter by an approved electrician.<br>– Replace the frequency converter if necessary (*refer to ▸ 386*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| | | Overpressure blower Q4 is defective. | Examine the overpressure blower Q4. |
| | | Fiber separator Q5 is defective. | Examine the fiber separator Q5. |
| | | Temperature is too high. | Increase the air exchange by opening the doors and the covers. |
| 206 | No control voltage 24VDC | There is an electrical problem. | Examine the modules A2.01 to A2.02. |
| 207 | S21/22/23 S31/32/33 S41/42 Several keys operated at the same time | It is an operator fault. | Tap only 1 key at a time. |
| 208 | No tube in the lap roller flanges and opener unit not in bottom position | Loading procedure is incorrect or stopped. | – Do a lap change.<br>– Set the tube position (when the tube is put between the lap disks) (*refer to* ▸ *211*).<br>– Set the tube position (when the tube is on the tube bridge) (*refer to* ▸ *212*). |
| | | The monitoring is incorrect. | Adjust the sensor of the lap disk (*refer to* ▸ *178*). |
| | | Tube arm is in the incorrect position. | Unlock the tube arm (*refer to* ▸ *211*). |
| 210 | Protection switch (valve Y82) triggered F22 | Overload or the pressure regulating valve Y82 is defective. | Find the defective elements and replace the defective elements. |
| | | There is a temporary overload. | Let the elements to cool off. Increase the air exchange by opening the doors and the covers. |
| 212 | Low battery! Do not switch off main switch -> Change battery | The battery is empty. | Replace the battery in the control system (*refer to* ▸ *341*). |
| 213 | Stop key blocked! A000 S21 S22 S23 | Incorrect operation. The operating element is in its engaged position. | – Release the operating elements.<br>– Remove the faults or warning messages (*refer to* ▸ *108*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| | | Wiring | – Examine the function of the elements in the data screen 81.1.<br>– Do an electrical check of the wiring for the operating element. |
| 216 | Warning frequency converter! See manual freq.converter cp.7 | Frequency converter | Replace the frequency converter (*refer to ▸ 386*). |
| 220 | Emergency shutdown activated S1 S11 | Emergency stop button is engaged. | Release all the emergency stop buttons. |
| | | Emergency stop button is defective. | Examine the emergency stop button and replace the emergency stop button if necessary. |
| 221 | External emergency shutdown activated Terminals 201/202 | External emergency shutdown is started. | – Find the cause of the emergency shutdown.<br>– Remove the cause of the emergency shutdown.<br>– Make sure that there are no more danger areas. |
| 227 | Door lap head left, open S50/51 | Secured doors, covers, or hoods are open. | Close the doors, the covers, or the hoods. |
| | | Incorrect signal comes from the sensor system. | Do the function test (*refer to ▸ 113*). |
| 228 | Door calender open S52 | Secured doors, covers, or hoods are open. | Close the doors, the covers, or the hoods. |
| | | Incorrect signal comes from the sensor system. | Do the function test (*refer to ▸ 113*). |
| 229 | Door lap head right, open S54/55 | Secured doors, covers, or hoods are open. | Close the doors, the covers, or the hoods. |
| | | Incorrect signal comes from the sensor system. | Do the function test (*refer to ▸ 113*). |
| 230 | Drafting system hood open S61/62 | Secured doors, covers, or hoods are open. | Close the doors, the covers, or the hoods. |
| | | Incorrect signal comes from the sensor system. | Do the function test (*refer to ▸ 113*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 231 | Drafting system drawer / table calendar drawer open S63/64/65/66 | Secured doors, covers, or hoods are open. | Close the doors, the covers, or the hoods. |
| | | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▶ *113*). |
| 232 | Safety circuit K10 | There is an electrical fault in the safety circuit | Examine the safety circuit (*refer to* ▶ *81*). |
| 240 | During the first 5s delivery is less than 1m/min B270 | There is a problem with the drive: The machine is not started up. | Set the drive belt for lap compression (*refer to* ▶ *180*). |
| 241 | Winding: set delivery and actual delivery do not match B270 | There is a problem with drive: The machine is not started up. | Set the drive belt for lap compression (*refer to* ▶ *180*). |
| 242 | Winding: set pressure and actual pressure do not match Y82 | Main pressure is not sufficient. | Set the main pneumatic pressure (*refer to* ▶ *249*). |
| | | Silencers are blocked. | Replace the silencers (*refer to* ▶ *394*). |
| | | There is an incorrect signal voltage. | – Examine the pressure regulating valves with the LED indicators (*refer to* ▶ *247*).<br>– Examine the signal voltage of the pressure regulating valve (*refer to* ▶ *249*). |
| | | The actual value and the target value do not match. | – Examine the pressure value of the tension unit cylinder (*refer to* ▶ *250*).<br>– Read the actual value and the target value from the data screen 30.5. |
| | | There is insufficient air of pressure. | Find the leak and repair the leak. |
| 244 | No compressed air to the drafting system S72 | Insufficient supply of compressed air. | Make sure that there is sufficient supply of compressed air. |
| | | There is no sufficient main pressure. | Set the main pneumatic pressure (*refer to* ▶ *249*). |
| | | Incorrect setting of the pressure reduction valve | Set the pressure of the drafting system (*refer to* ▶ *254*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| | | The pressure monitor is not set correctly. | Set the pressure monitor of the drafting system (*refer to* ▸ *255*). |
| | | The pressure regulating valve Y82 is defective. | Replace the pressure regulating valve Y82. |
| 245 | No vacuum suction S71 | There is no sufficient suction power for exhaust air. | Make sure that there is sufficient suction power. |
| | | The switching point for the vacuum monitoring is set incorrectly. | Set the vacuum monitor of the vacuum suction (*refer to* ▸ *257*). |
| 246 | Lap ejection: Lap not ejected B198 | Incorrect signal comes from the optical sensor. | Examine the sensor system. |
| | | Lap does not go to the set position. | – Remove the obstacle.<br>– Move the lap by hand to the lap transfer station. |
| 248 | Service: Front door not closed Y18,B201 | Secured doors, covers, or hoods are open. | Close the doors, the covers, or the hoods. |
| | | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |
| 250 | Contact pressure drafting system: Fault in the pressure switch Y21,S72 | The pressure monitoring is not set correctly. | Set the pressure monitor of the drafting system (*refer to* ▸ *255*). |
| 254 | Start initiation: Tube fetcher not at the top Y8,B001 | The machine is moved to a position in the service mode and is at this time not ready for operation. | Put machine to the starting position (*refer to* ▸ *143*). |
| 255 | Move lap carrier: Locking mechanism not released Y28 | The machine is moved to a position in the service mode and is at this time not ready for operation. | Put machine to the starting position (*refer to* ▸ *143*). |
| 260 | Front door: Not closed Y18,B201 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |
| 261 | Front door: Not open Y17,B202 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |
| 262 | Front door: Does not open Y17,B201 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |
| 263 | Front door: Does not close Y18,B202 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 264 | Front door: Sensor technical error B201/202 | There is an incorrect combination. | Examine the sensor system. |
| 265 | Tube bridge: Not up Y12,B220 | The machine is moved to a position in service mode and is at this time not ready for operation. | Put machine to the starting position (*refer to* ▶ *143*). |
| 266 | Tube bridge: Not downY13,B221 | The machine is moved to a position in the service mode and is at this time not ready for operation. | Put machine to the starting position (*refer to* ▶ *143*). |
| 267 | Tube bridge: Does not open Y13,B220 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▶ *113*). |
| 268 | Tube bridge: Does not closeY12,B224 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▶ *113*). |
| 269 | Tube bridge: Sensor technical error B220/221 | There is an incorrect combination | Examine the sensor system. |
| 270 | Lap roller flanges: Failed to close on the right Y5,B204 | The tube arm is adjusted incorrectly. The tube is not at the center. | Set the tube position (when the tube is put between the lap disks) (*refer to* ▶ *211*). |
| | | The monitor for the tube arm is set incorrectly. The lap disks close before the tube arm goes to the end position. | Set the proximity switches of the tube arm (*refer to* ▶ *213*). |
| | | The tube arm lowers too quickly, and the lap belts do not slack. | Set the speed of the tube arm (*refer to* ▶ *210*). |
| | | Interruption during lap change: There is a power failure or the emergency stop button is pushed. | – Stop the machine.<br>– Select the service mode in the data screen 80.1.<br>– Lift the tensioner unit (this releases the tension in the lap belt).<br>– Open the lap disks.<br>– Select the automatic mode in the data screen 80.1.<br>– Push the start button. |
| | | The ejector pins are blocked. | Examine the ejector pins. |
| | | The monitoring is incorrect. | Adjust the sensor of the lap disk (*refer to* ▶ *178*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 271 | Lap roller flanges: Failed to close on the left Y5,B203 | The tube arm is adjusted incorrectly. The tube is not at the center. | Set the tube position (when the tube is put between the lap disks) (*refer to* ▸ *211*). |
| | | The monitor for the tube arm is set incorrectly. The lap disks close before the tube arm goes the end position. | Set the proximity switches of the tube arm (*refer to* ▸ *213*). |
| | | The tube arm lowers too quickly, and the lap belts do not slack. | Set the speed of the tube arm (*refer to* ▸ *210*). |
| | | Interruption during the lap change: There is a power failure or the emergency stop button is pushed. | – Stop the machine.<br>– Select the service mode in the data screen 80.1.<br>– Lift the tensioner unit (this releases the tension in the lap belt).<br>– Open the lap disks.<br>– Select the automatic mode in the data screen 80.1.<br>– Push the start button. |
| | | The ejector pin is blocked. | Examine the ejector pin. |
| | | The monitoring is incorrect. | Adjust the sensor of the lap disk (*refer to* ▸ *178*). |
| 272 | Lap roller flanges: Failed to open on the right Y6,B204 | The ejector pin is blocked. | Examine the ejector pins. |
| | | The monitoring is incorrect. | Adjust the sensor of the lap disk (*refer to* ▸ *178*). |
| 273 | Lap roller flanges: Failed to open on the left Y6,B203 | The ejector pin is blocked. | Examine the ejector pins. |
| | | The monitoring is incorrect. | Adjust the sensor of the lap disk (*refer to* ▸ *178*). |
| 275 | Lap roller flanges: Front door not closed B201 | There is a blockage for safety reasons: jam protection. | Close the front door. |
| 276 | Front door: Not closed Y18,B201 | Secured doors, covers, or hoods are open. | Close the doors, the covers, or the hoods. |
| 277 | Lap roller flanges: Fail to close Y5,B203/204 | The ejector pin is blocked. | Examine the ejector pins. |
| 278 | Laper area blocked! Check fleece and incoming sliver | The suction is too strong. The slivers are moved into the direction of the suction. | Set the suction of the calendar rollers and the lap compression space (*refer to* ▸ *218*). |

| **Fault Code** | **Fault Text** | **Fault Cause** | **Remedy** |
|---|---|---|---|
| 280 | Calender: Has only opened on the left Y19,B205 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 281 | Calender: Has only opened on the right Y19,B206 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 282 | Calender: Has not opened Y19,B205/206 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 283 | Calender: Has only closed on the right Y19,B205 | There is winding of fibers around the calender roller at the drive side. | – Clean the calender roller wipers (*refer to* ▸ *300*).<br>– Examine the calender roller wipers (*refer to* ▸ *167*). |
| 284 | Calender: Has only closed on the left Y19,B206 | There is winding of fibers around the calender roller | – Clean the calender roller wipers (*refer to* ▸ *300*).<br>– Examine the calender roller wipers (*refer to* ▸ *167*). |
| 285 | Calender: Has not closed Y19,B205/206 | There is winding of fibers around the calender roller. | – Clean the calender roller wipers (*refer to* ▸ *300*).<br>– Examine the calender roller wipers (*refer to* ▸ *167*). |
| | | There is a frequent wrapping of fibers around the calender roller. | – Decrease the service interval of the calender and the wipers.<br>– Clean the calender roller wipers (*refer to* ▸ *300*).<br>– Examine the calender roller wipers (*refer to* ▸ *167*). |
| 286 | Calander clutch: does not open! | Pneumatic system | – Examine the air gap at the coupling in a closed condition (*refer to* ▸ *334*).<br>– If the coupling condition is not correct, examine the pneumatic operating unit and correct the problems. |
| | | Sensor | Examine and set the monitoring of the coupling. |
| | | The clutch is dirty. | Clean the coupling of the main motor and the calender drive (*refer to* ▸ *305*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 287 | Calander clutch: does not close! | Tooth-against-tooth contact | – Examine the open condition and the close condition of the coupling.<br>– If the coupling cannot close fully because of the contact between the teeth, move the drive unit so the coupling can fully locks into position. |
| | | Pneumatic system | – Examine the air gap at the coupling in a closed condition (*refer to* ▸ *334*).<br>– If the coupling condition is not correct, examine the pneumatic operating unit and correct the problems. |
| | | Sensor | Examine and set the monitoring of the coupling. |
| | | The clutch is dirty. | Clean the coupling of the main motor and the calender drive (*refer to* ▸ *305*). |
| 288 | Opener unit: Fixing left / right not open Y7,B224/225 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 289 | Opener unit: Fixing left / right not closed Y7,B224/225 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 290 | Opener unit: End position top not reached Y4.1/3.2,B207 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 291 | Opener unit: End position bottom not reached Y3.1/4.2,B208 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 292 | Opener unit: Does not close Y4.1/3.2,B208 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 293 | Opener unit: Does not open Y3.1/4.2,B207 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 294 | Opener unit: Sensor technique error B207/208 | There is an incorrect combination | Examine the sensor system. |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 295 | Opener unit: Tube fetcher in the way B001 | The machine is moved to a position in the service mode and is at this time not ready for operation. | Put machine to the starting position (*refer to* ▸ *143*). |
| 296 | Opener unit: Front door not closed B201 | There is a blockage for safety reasons | Put machine to the starting position (*refer to* ▸ *143*). |
| 300 | Tension unit: End position top not reached Y2,B211 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| | | Monitoring of the tension arm is not set correctly at the top. | Set the proximity switch B 211 (*refer to* ▸ *202*). |
| 301 | Tension unit: End position bottom not reached Y1,B212 | Blockage or obstacle below the tension arm | Remove the blockage or the obstacle. |
| | | Monitoring of the tension arm is not set correctly at the bottom. | Set the proximity switch B 212 (*refer to* ▸ *206*). |
| 302 | Tension unit: Does not close Y1,B212 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| | | Monitoring of the tension arm is not set correctly at the bottom. | Set the proximity switch B 212 (*refer to* ▸ *206*). |
| 303 | Tension unit: Does not open Y2,B211 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| | | Monitoring of the tension arm is not set correctly at the top. | Set the proximity switch B 211 (*refer to* ▸ *202*). |
| 307 | Tension unit: Sensor technique error B211/212 | There is an incorrect combination | Examine the sensor system. |
| 309 | Tension unit: End stop bottom reached B212 | The lap belt is damaged or stretched. | Replace the lap belt (*refer to* ▸ *360*). |
| | | Monitoring of the tension arm is not set correctly at the bottom. | Set the proximity switch B 212 (*refer to* ▸ *206*). |
| 314 | Tension unit: Belt tension not reached Y82 | The main pressure is not sufficient. | Set the pneumatic pressure. |
| | | There is an incorrect signal voltage. | – Examine the pressure regulating valves with the LED lamps (*refer to* ▸ *247*).<br>– Examine the signal voltage at the pressure regulating valve (*refer to* ▸ *249*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 315 | Tension unit: pressure out of range! | The parameter on the data screen 41.2 is not set correctly. | – Do a check if the valve Y82 of SMC is installed on the machine.<br>– If the valve Y82 of SMC is installed, set the parameter to yes |
| | | The valve Y82 is not installed correctly or the valve Y82 is broken. | – Reinstall the valve Y82 or replace the valve Y82. |
| 320 | Lap operation: Lap oversized -> Push out lap B211 | The lap weight and the lap length do not match. | – Examine the lap ejection.<br>– Adjust the total draft of the drafting system (*refer to* ▸ *223*).<br>– Adjust the break draft of the drafting system (*refer to* ▸ *224*).<br>– Change the lap length (*refer to* ▸ *110*). |
| | | Monitoring of the tension arm is not set correctly at the top. | Set the proximity switch B211 (*refer to* ▸ *202*). |
| 321 | Lap operation: Opener unit not up Y3.2/4.1,B207 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 323 | Lap operation: Calender not pressed on Y19,B205/206 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 330 | Tube fetcher: End position top not reached Y8,B001 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 331 | Tube fetcher: End position bottom not reached Y9,B002 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 333 | Tube fetcher: Does not start Y9,B001 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |
| 335 | Tube fetcher: Sensor technique error B001/002 | There is an incorrect combination | Examine the sensor system. |
| 336 | Tube gripper: Does not close Y11,B004 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 337 | Tube gripper: Does not open Y10,B005 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 338 | Tube gripper: Not open Y10,B004 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |
| 339 | Tube gripper: No tube in the gripper B005 | Loading procedure is incorrect or stopped. | – Do a lap change.<br>– Set the tube position (when the tube is put between the lap disks) (*refer to* ▸ *211*).<br>– Set the tube position (when the tube is on the tube bridge) (*refer to* ▸ *212*). |
| 340 | Tube gripper: Sensor technique error B004/005 | There is an incorrect combination. | Examine the sensor system. |
| 341 | Tube gripper: Opening unit not down B208 | Loading procedure is incorrect or stopped. | – Do a lap change.<br>– Set the tube position (when the tube is put between the lap disks) (*refer to* ▸ *211*).<br>– Set the tube position (when the tube is on the tube bridge) (*refer to* ▸ *212*). |
| 342 | Tube fetcher (warning): No tube in the feed device B005 | Loading procedure is incorrect or stopped. | – Do a lap change.<br>– Set the tube position (when the tube is put between the lap disks) (*refer to* ▸ *211*).<br>– Set the tube position (when the tube is on the tube bridge) (*refer to* ▸ *212*). |
| 343 | Load tube: Fetcher not up Y8,B001 | Loading procedure is incorrect or stopped. | – Do a lap change.<br>– Set the tube position (when the tube is put between the lap disks) (*refer to* ▸ *211*).<br>– Set the tube position (when the tube is on the tube bridge) (*refer to* ▸ *212*). |
| 345 | Raise fetcher: Tube in the magazine | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 346 | Tube fetcher: Front door not closed B201 | There is a blockage for safety reasons. | Put machine to the starting position (*refer to* ▸ *143*). |
| 348 | Tube fetcher (undefined pos.): Move to home position | There is a fault. | Correct the fault. |
| 349 | Tube fetcher; -gripper; -bridge; lap- flanges; Open.unit not in the home pos. | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |
| 350 | Feed frame right: Ends down B331-344 | There is a sliver break. | Piece the sliver by hands. |
| | | The feed roller drive in the drafting system is stopped. | – Find if the flexible coupling is defective, or if a belt is damaged.<br>– Replace the flexible coupling (*refer to* ▸ *375*).<br>– Replace the belt for the feed bottom roller (*refer to* ▸ *373*). |
| | | Undefined condition because the sensor was connected or disconnected while the voltage was applied. | Set the main switch to the position OFF and then to the position ON. |
| 351 | Feed frame left: Ends down B311-324 | There is a sliver break | Piece the sliver by hands. |
| | | The feed roller drive in the drafting system is stopped. | – Find if the flexible coupling is defective, or if a belt is damaged.<br>– Replace the flexible coupling (*refer to* ▸ *375*).<br>– Replace the belt for the feed bottom roller (*refer to* ▸ *373*). |
| | | Undefined condition because the sensor was connected or disconnected while the voltage was applied. | Set the main switch to the position OFF and then to the position ON. |
| 352 | Feed frame right: No sliver B331-344 | There is a sliver break. | Piece the sliver by hands. |

| **Fault Code** | **Fault Text** | **Fault Cause** | **Remedy** |
|---|---|---|---|
| | | The feed roller drive in the drafting system is stopped. | – Find if the flexible coupling is defective, or if a belt is damaged.<br>– Replace the flexible coupling (*refer to* ▸ *375*).<br>– Replace the belt for the feed bottom roller (*refer to* ▸ *373*). |
| | | Undefined condition because the sensor was connected or disconnected while the voltage was applied. | Set the main switch to the position OFF and then to the position ON. |
| 353 | Feed frame left: No sliver B311-324 | There is a sliver break | Piece the sliver by hands. |
| | | Feed roller drive in the drafting system is stopped. | – Find if the flexible coupling is defective, or if a belt is damaged.<br>– Replace the flexible coupling (*refer to* ▸ *375*).<br>– Replace the belt for the feed bottom roller (*refer to* ▸ *373*). |
| | | Undefined condition because the sensor was connected or disconnected while the voltage was applied. | Set the main switch to the position OFF and then to the position ON. |
| 360 | Feed table 1: Lap formation drafting system D1,U4 | The cot is damaged or worn out or dirty. | – Clean the cot.<br>– Examine the rubber cot surface of the top rollers (*refer to* ▸ *337*).<br>– Examine the rubber cot wear of the top rollers (*refer to* ▸ *337*). |
| | | The top roller wiper is worn out. | – Examine the drafting system wipers (*refer to* ▸ *338*). |
| | | The bottom roller wiper is worn out. | – Examine the drafting system wipers (*refer to* ▸ *338*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 361 | Feed table 2: Lap formation drafting system D2,U4 | The cot is damaged or worn out or dirty. | – Clean the cot.<br>– Examine the rubber cot surface of the top rollers (*refer to* ▸ *337*).<br>– Examine the rubber cot wear of the top rollers (*refer to* ▸ *337*). |
| | | The top roller wiper is worn out. | – Examine the drafting system wipers (*refer to* ▸ *338*). |
| | | The bottom roller wiper is worn out. | – Examine the drafting system wipers (*refer to* ▸ *338*). |
| 362 | Table calender 1: Slub in the batt B40 | There is a malfunction | Correct the fault. |
| 363 | Table calender 2: Slub in the batt B41 | There is a fault | Correct the fault. |
| 364 | Long part clutch: dose not open! | Pneumatic system | – Examine the air gap at the coupling in a closed condition (*refer to* ▸ *334*).<br>– Examine the air gap at the coupling in an open condition (*refer to* ▸ *335*).<br>– If the coupling condition is not correct, examine the pneumatic operating unit and correct the problems. |
| | | Sensor | Examine and set the proximity switch of the coupling (*refer to* ▸ *161*). |
| | | The clutch is dirty. | Clean the coupling of the main motor and the calender drive (*refer to* ▸ *305*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 365 | Long part clutch: dose not close! | Tooth-against-tooth contact | – Examine the air gap at the coupling in a closed condition (*refer to* ▸ *334*).<br>– Examine the air gap at the coupling in an open condition (*refer to* ▸ *335*).<br>– If the coupling cannot close fully because of the contact between the teeth, move the drive unit so the coupling can fully lock into position. |
| | | Pneumatic system | – Examine the air gap at the coupling in a closed condition (*refer to* ▸ *334*).<br>– Examine the air gap at the coupling in an open condition (*refer to* ▸ *335*).<br>– If the coupling condition is not correct, examine the pneumatic operating unit and correct the problems. |
| | | Sensor | Examine and set the monitoring of the coupling. |
| | | The clutch is dirty. | Clean the coupling of the main motor and the calender drive (*refer to* ▸ *305*). |
| 370 | SERVOtrolley: Advance not at the rear Y25,B191 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 371 | SERVOtrolley: Advance not at the front Y24,B192 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 372 | SERVOtrolley: Advance does not start Y24/28,B191 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 373 | SERVOtrolley: Sensor technique error, advance B191/192 | Incorrect combination | Examine the sensor system. |
| 374 | SERVOtrolley: Tilt device not down Y27,B194 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 375 | SERVOtrolley: Tilt device not up Y26,B193 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 376 | SERVOtrolley: Tilt device does not start Y26,B194 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 377 | SERVOtrolley: Sensor technique error, tilt device B193/194 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 379 | SERVOtrolley: Sensor technique error, lap carrier B191/192/196 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |
| 380 | SERVOmag:Advance not at the rear (home position) Y24,B191 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 381 | SERVOmag:Advance not at the front (work position) Y24,B192 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 382 | SERVOmag: Advance does not start Y24,B191 | There is a mechanical problem or a pneumatic problem. | Do the function test (*refer to* ▸ *113*). |
| 383 | SERVOmag: Sensor technique error B191/192 | Incorrect signal comes from the sensor system. | Do the function test (*refer to* ▸ *113*). |
| 384 | SERVOmag: Magazine is full B199 | There is a fault | Correct the fault. |
| 410 | Tube lifter: Lowering func. does not start Y31,B216 | Mechanical system | – Examine the movement of the tube guide.<br>– Set the tube lifting device (SERVOlap) (*refer to* ▸ *207*). |
| | | Pneumatic system | – Examine the valve of the pneumatic operating unit.<br>– Start the manual control of the solenoid valve (*refer to* ▸ *247*).<br>– Set the tube lifting device (SERVOlap) (*refer to* ▸ *207*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 411 | Tube lifter: Loading position not reached Y31,B215 | The tube is blocked. | – Remove the blocked tube.<br>– Make sure that the tube is correctly push forward at the top of the machine.<br>– Set the tube lifting device (SERVOlap) (*refer to* ▸ *207*). |
| | | Monitoring function | – Examine the proximity switches in the data screen 81.1 (*refer to* ▸ *137*).<br>– Set the proximity switches of the tube lifting system (SERVOlap) (*refer to* ▸ *209*). |
| 412 | Tube lifter: Raising function does not start Y30,B215 | Mechanical system | – Examine the tube guide for the movement.<br>– Set the tube lifting device (SERVOlap) (*refer to* ▸ *207*). |
| | | Pneumatic system | – Examine the valve of the pneumatic operating unit.<br>– Start the manual control of the solenoid valve (*refer to* ▸ *247*).<br>– Set the tube lifting device (SERVOlap) (*refer to* ▸ *207*). |
| 413 | Tube lifter: Unloading position not reached Y30,B216 | Monitoring function | – Examine the proximity switches in the data screen 81.1 (*refer to* ▸ *137*).<br>– Set the proximity switches of the tube lifting system (SERVOlap) (*refer to* ▸ *209*). |
| 440 | Belt control: Step motor malfunction, SW / DO135 | There is a software error. | Set the main switch to the position OFF and then to the position ON. |
| | | Step motor card | Examine the step motor card (*refer to* ▸ *244*). |

| Fault Code | Fault Text | Fault Cause | Remedy |
|---|---|---|---|
| 441 | Belt control: Shut-off limit on left exceeded | Not in the tolerance range. | – Adjust the belt control (*refer to ▸ 190*).<br>– Set the target position of the lap belt (*refer to ▸ 195*). |
| 442 | Belt control: Step motor card malfunction | There is a motor damage. | – Replace the motor for the belt control mechanism (*refer to ▸ 367*).<br>– Tighten the toothed belt (*refer to ▸ 369*). |
| | | Step motor card | Examine the step motor card (*refer to ▸ 244*). |
| 443 | Belt control: No signal for reference position | Sensor for position 0 is set incorrectly. | Set the proximity switch for the position 0 (*refer to ▸ 198*). |
| | | The step motor is not operating. | Examine the movement of the belt control mechanism (*refer to ▸ 196*). |
| 444 | Belt control: Shut-off limit on right exceeded | Not in the tolerance range | – Adjust the belt control (*refer to ▸ 190*).<br>– Set the target position of the lap belt (*refer to ▸ 195*). |

## 8.4 Faults Not Shown on the Data Screens

This section contains the information about the faults that are not shown on the data screens. The faults are given regarding the machine components.

### 8.4.1 Lap Delivery

| Fault | Cause | Remedy |
|---|---|---|
| Lap change is too slow. | The throttle valves at the pneumatic cylinders are not set correctly. | Set the throttle valves at all the pneumatic cylinders with the dial symbol. Refer to the electrical documentation: Z2, Z4, Z12.1, Z12.2, Z19. |

| Fault | Cause | Remedy |
|---|---|---|
| Irregular winding face, hairy, or leak | The feed width is too large or too small. | – Examine the cross-section of batt (*refer to ▸ 172*).<br>– Adjust the guide for web narrowing in the open position (*refer to ▸ 169*).<br>– Adjust the sliver guide (*refer to ▸ 235*). |
| | The lap belt makes contact with a lap disk. | – Adjust the belt during the lap build-up procedure (*refer to ▸ 179*).<br>– Visually examine the operation position of the lap belt (*refer to ▸ 329*). |
| | The suction is too strong. The slivers are moved into the direction of the suction. | Set the suction for the lap compression space (*refer to ▸ 218*). |
| Hairy lap increasing with small lap diameters. | There is no sufficient tension for the small lap diameters. | – Examine the tension of the batt at the small lap diameter (*refer to ▸ 164*).<br>– Material change: adapt tension draft (*refer to ▸ 150*).<br>– Decrease the production speed. |
| Conical laps | The calender load is set incorrectly. | Set the pressure of the calender rollers (*refer to ▸ 253*). |
| Tubes are damaged. The material becomes damaged on the lap winding face. | The tube clamping is incorrect. | Adjust the tube clamping of lap disks (*refer to ▸ 176*). |
| | The tube arm is adjusted incorrectly. The tube is not at the center position. | Set the tube position (when the tube is put into the lap disks) (*refer to ▸ 211*). |

### 8.4.2 Lap Head

| Fault | Cause | Remedy |
|---|---|---|
| There are noises of a coupling chattering. | The clutch is dirty. | Clean the coupling of the main motor and the calender drive (*refer to ▸ 305*). |

| Fault | Cause | Remedy |
|---|---|---|
| | The clutch is adjusted incorrectly. | – Examine the air gap at the coupling in a closed condition (*refer to* ▸ *334*).<br>– Adjust the air gap at the coupling (*refer to* ▸ *159*). |

### 8.4.3 Calender Module

| Fault | Cause | Remedy |
|---|---|---|
| Extend/retract speed of the pneumatic cylinder is too quick or too slow. | There is an incorrect adjustment. | Adjust the speed of the guides for web narrowing (*refer to* ▸ *171*). |
| The monitor does not react to lap formation on the calender roller or the reaction is too late. | The monitor is not set sensitively enough. | Adjust the sensor for the calender load (*refer to* ▸ *165*). |
| The monitor reacts but there is no lap formation on the calender roller. | The monitor is set too sensitively. | Adjust the sensor for the calender load (*refer to* ▸ *165*). |

### 8.4.4 Lap Disks

| Fault | Cause | Remedy |
|---|---|---|
| Rhythmical noise, whose frequency decreases when the lap diameter increases. | The lap disk bearings are damaged. | – Replace the lap disks (*refer to* ▸ *348*).<br>– Replace the lap disk cylinders (*refer to* ▸ *350*).<br>– Replace the lap disk bearings. |
| Lap disks open in the production mode. | There is an incorrect pressure contour. Too much pressure is supplied. | Set the pressure of the tension arm roller (*refer to* ▸ *251*). |
| | Lap disk cylinder is not tight. | – Replace the lap disk cylinder (*refer to* ▸ *350*).<br>– Replace the seals. |
| There is a bang when closing the lap disks | The tube arm is set incorrectly. The tube is not at the center position. | Set the tube position (when the tube is put into the lap disks) (*refer to* ▸ *211*). |

### 8.4.5 Lap Compression

| Fault | Cause | Remedy |
|---|---|---|
| Lap belt is not clean. | There are impurities. | Clean the lap belt and the deflection rollers (*refer to* ▸ *304*). |
| | The edge of the lap belt is damaged. | – Adjust the suction nozzle (*refer to* ▸ *187*).<br>– If the damage can be repaired by grinding and polishing, visually examine the operating position of the lap belt (*refer to* ▸ *329*).<br>– If the damage cannot be repaired, replace the lap belt (*refer to* ▸ *360*). |
| The edge of the lap belt is damaged. | The lap belt makes contact with a lap disk. | – Adjust the belt during the lap build-up procedure (*refer to* ▸ *179*).<br>– Visually examine the operation position of the lap belt (*refer to* ▸ *329*). |
| | The impurities on the pawls can influence the operation of the lap belt. | Examine the contact surfaces of the pawls. |
| | The lap belt makes contact only with the lap disk at the right side because the lap disks are not set correctly. | Set the pressure of the lap disk (*refer to* ▸ *254*). |
| | The edge suction for the lap belt is set incorrectly. | – Adjust the suction nozzle (*refer to* ▸ *187*).<br>– If the damage can be repaired by grinding and polishing, visually examine the operation position of the lap belt (*refer to* ▸ *329*).<br>– If the damage cannot be repaired, replace the lap belt (*refer to* ▸ *360*). |

| Fault | Cause | Remedy |
|---|---|---|
| Lap belt is damaged on the left side. | The sensor is set too far to the left side, thus the belt makes contact with the lap disk because of the belt control mechanism. | – Adjust the sensor of the belt control mechanism (*refer to* ▸ *189*).<br>– Adjust the belt during the lap build-up procedure (*refer to* ▸ *179*). |
| | Lap belt control | – Visually examine the operation position of the lap belt (*refer to* ▸ *329*).<br>– Adjust the belt during the lap build-up procedure (*refer to* ▸ *179*).<br>– Adjust the belt control (*refer to* ▸ *190*). |

### 8.4.6 Lap Belt

| Fault | Cause | Remedy |
|---|---|---|
| There is a squeaking noise that continues more than 30 seconds. | The lap belt makes contact with a lap disk. | – Adjust the belt during the lap build-up procedure (*refer to* ▸ *179*).<br>– Visually examine the operation position of the lap belt (*refer to* ▸ *329*). |

### 8.4.7 Passive Arm

| Faults | Cause | Remedy |
|---|---|---|
| There is an impact noise during the tube change. | The passive arm does not move easily to the end position because the signal is set incorrectly. | Adjust the proximity switch of the passive arm (*refer to* ▸ *188*). |

### 8.4.8 Pneumatic Unit

| Faults | Cause | Remedy |
|---|---|---|
| There is no pneumatic switching of the solenoid valve. | The valve is blocked. | – Start the manual control of the solenoid valve (*refer to* ▸ *247*).<br>– If the valve is defective, replace the valve (*refer to* ▸ *394*). |

| Faults | Cause | Remedy |
|---|---|---|
| There is a leak in the solenoid valve. | The seal is damaged or not installed correctly. | Replace the valve (*refer to* ▸ *394*). |

### 8.4.9 Longitudinal Section

| Fault | Cause | Remedy |
|---|---|---|
| The web is drawn incorrectly. | The drive belts are worn out. | – Set the belt to the center position at the pulley (*refer to* ▸ *221*).<br>– Replace the belt for the feed bottom roller (*refer to* ▸ *373*). |
| | There is a slippage on the flat belt. | Examine the belt tension (*refer to* ▸ *331*). |
| | Drafting load is not sufficient because of the compressed air. | Set the pressure of the drafting system (*refer to* ▸ *254*). |
| | Drafting load is not sufficient because the loading elements are not sealed. | Examine the loading elements (*refer to* ▸ *341*). |
| Web breakage at the web guide on the drafting system. Blockage in front of the table calender. | Drive belts are worn out. | – Set the belt to the center position at the pulley (*refer to* ▸ *221*).<br>– Replace the belt for the feed bottom roller (*refer to* ▸ *373*). |
| | Flexible coupling is broken. | – Examine the drive.<br>– Replace the flexible coupling if necessary (*refer to* ▸ *375*). |
| | Drive shaft is broken. | – Examine the drive.<br>– Replace the universal shaft in the drafting system if necessary (*refer to* ▸ *379*). |
| Broken web in the drafting system. | Drive belts are worn out. | – Set the belt to the center position at the pulley (*refer to* ▸ *221*).<br>– Replace the belt for the feed bottom roller (*refer to* ▸ *373*). |
| The web breaks before the web is at the lap head. | The clutch for the longitudinal section is not closed. | Examine the air gap at the coupling in a closed condition (*refer to* ▸ *334*). |

| Fault | Cause | Remedy |
|---|---|---|
| The web breaks before the web is at the lap head during the lap change. | The clutch of the calender is not open during the lap change. | Examine the air gap at the coupling in an open condition (*refer to* ▸ *335*). |
| Material blockage upline of the lap head during the lap change | The clutch of the longitudinal section is not open during the lap change. | Examine the air gap at the coupling in an open condition (*refer to* ▸ *335*). |
| Material blockage upline of the lap head | The clutch of the calender is not closed. | Examine the air gap at the coupling in a closed condition (*refer to* ▸ *334*). |
| There is damage to bearings or the belt. | Belt tension is too high. | Examine the belt tension (*refer to* ▸ *331*). |

## 8.4.10 Web Table

| Fault | Cause | Remedy |
|---|---|---|
| There are slubs in the web. | The distance of the drafting system is set too high. | Material change: adapt the tension draft (*refer to* ▸ *150*). |
| | The sliver guide is missing. | Adjust the sliver guide (*refer to* ▸ *235*). |
| | The web is drawn incorrectly. | Put the sliver correctly. |

## 8.4.11 Drafting System

| Faults | Cause | Remedy |
|---|---|---|
| There are frequent laps on the bottom rollers. | The wipers are dirty. | Clean the longitudinal section with water (*refer to* ▸ *302*). |
| | The bottom roller wiper is worn out. | Examine the bottom roller wipers (*refer to* ▸ *338*). |
| There are frequent laps on the top rollers. | The cot is damaged, worn out, or dirty. | – Clean the cot.<br>– Examine the rubber cot surface of the top rollers (*refer to* ▸ *337*).<br>– Examine the rubber cot wear of the top rollers (*refer to* ▸ *337*). |
| | The top roller wiper is worn out. | Examine the top roller wiper (*refer to* ▸ *338*). |
| No stop during lapping. | Lap monitoring does not operate. | Examine the function test of top roller monitoring (*refer to* ▸ *232*). |

### 8.4.12 Creel

| Fault | Cause | Remedy |
|---|---|---|
| Frequent ends down. | The feed sliver is defective. | – Replace the defective can.<br>– Find the causes for the defective sliver on the draw frame and put the sliver correctly. |
| | The cans are put incorrectly. | Set the cans correctly. |

### 8.4.13 Control System

| Fault | Cause | Remedy |
|---|---|---|
| The control system cannot be booted correctly. The display module of the control system does not show after 30 seconds. | There is a system problem. | Do a cold start of the controller (*refer to* ▸ *242*). |

### 8.4.14 Frequency Converter

| Faults | Cause | Remedy |
|---|---|---|
| There is no reaction of the frequency converter. | There is no power. | – Examine the supply voltage.<br>– Connect the frequency converter again if necessary. |
| | The hardware is defective. | – Replace the frequency converter (*refer to* ▸ *386*).<br>– Set the frequency converter. Adapt the frequency converter to the cooling system (*refer to* ▸ *390*). |

### 8.4.15 Operating Unit

| Fault | Cause | Remedy |
|---|---|---|
| There are black strips on the screen of the operating unit. | The screen contrast is set incorrectly. | Set the brightness of the screen with the program key [Brighter Display] or [Darker Display]. |
| There is no response from the keys on the operating unit. | The key cannot be used in its current condition. | Follow the instructions on the screen. For example, only use this function when the machine is at a standstill. |

| Fault | Cause | Remedy |
|---|---|---|
| | The key is defective. | If the test in the applicable test data screens shows that the key has no reaction, replace the operating unit. |
| The screen is dark. | The operating unit is defective. | Replace the key strip (*refer to* ▶ *393*). |

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# 9 Maintenance

This chapter contains information about:

- The cleaning work of the machine
- The lubrication of the machine
- The inspection of the machine

More information about the electric devices and pneumatic devices is to be found in the electrical documentation.

## 9.1 Maintenance Personnel

Only Rieter-approved personnel are permitted to do maintenance work at the machine.

## 9.2 Interval Specification

The intervals that follow are guide values.

| Interval Specification | Duration in 3-Shift Operation |
|---|---|
| 165 operating hours | 1 week |
| 330 operating hours | 2 weeks |
| 660 operating hours | 4 weeks |
| 1 320 operating hours | 8 weeks |
| 2 000 operating hours | 3 months |
| 4 000 operating hours | 6 months |
| 8 000 operating hours | 1 year |
| 16 000 operating hours | 2 years |
| 24 000 operating hours | 3 years |
| 32 000 operating hours | 4 years |

## 9.3 Protocol for the Safety Circuit

Each replaced safety device is recorded in the protocol for the safety circuit.

The steps to replace the safety devices are as follows:

1. Identify each safety device in the electrical documentation.
2. To replace a safety device, refer to the operation manual. Replace the related safety devices fully.
3. To do the function test of each replaced safety device, refer to the related description in this chapter.

Example of a protocol for the safety circuit:

| Date | Device Tag | Location | Description | Name | Initials |
|---|---|---|---|---|---|
| 01-01-2015 | S8 | = SLO + EC1 | The emergency stop button is replaced because the red push-button has mechanical damage. | J. Meyer | JM |
| 01-07-2016 | | | A function test of the safety circuit is done during the commissioning. | Field Engineer | FE |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |

## 9.4 Lubricants

This chapter contains information about the lubricants for this machine.

Before the replacement of the used lubricant by a lubricant of a different supplier all lubricant lines and gears are to be cleaned.

| Lubricant | Lubricant Class | Supplier | Name |
|---|---|---|---|
| CC150<br>Mineral gear oil | ISO VG 150 | AGIP | BLASIA 150 |
| | | AVIA | AVIA GEAR RSX 150 |
| | | BP | ENERGOL GR-XP 150 |
| | | CASTROL | ALPHA SP 150 |
| | | EXXON MOBILE | MOBILGEAR 600 XP 150 |
| | | KLÜBER | KLÜBEROIL GEM 1–150 N |
| | | OPTIMOL | OPTIGEAR BM 150 |
| | | PETRO CANADA | ENDURATEX EP 150 |
| | | SHELL | OMALA S2 G 150 |
| | | TEXACO | MEROPA 150 |
| | | VALVOLINE | EPG 150 |
| EP2<br>Synthetic grease | NLGI 2/1 | AGIP | GR MU EP 2 |
| | | AVIA | AVIALITH 2 EP |
| | | BP | ENERGREASE LS-EP 2 |
| | | CASTROL | SPHEEROL EPL 2 |
| | | EXXON MOBILE | MOBILUX EP 2 |

| Lubricant | Lubricant Class | Supplier | Name |
|---|---|---|---|
| | | KLÜBER | MICROLUBE GBU-Y 131 |
| | | LAGERMEISTER | LAGERMEISTER TS |
| | | PETRO CANADA | PRECISION GENERAL PURPOSE EP 2 |
| | | SHELL | GADUS S2 V220 2 |
| | | TEXACO | MULTIFAK EP 2 |
| CLP PG 220<br>Synthetic oil | ISO VG 220 | CASTROL | ALPHASYN GS 220 |
| | | CASTROL | ALPHASYN PG 220 |
| | | CASTROL | TRIBOL 800/220 |
| | | KLÜBER | KLÜBERSYNTH GH 6-220 |
| | | SHELL | OMALA S4 WE 220 |

## 9.5 Cleaning Table by Cycle

| Target group | Cleaning cycle | Additional information | |
|---|---|---|---|
| Operator | Cleaning each 4 h | 9.9.1 | Cleaning the Longitudinal Section |
| | | 9.9.4 | Cleaning the Waste Chamber of the Fiber Separator |
| | Cleaning each 8 h | 9.9.2 | Cleaning the Calender Roller Wipers |
| | | 9.9.3 | Cleaning the Batt Guide Area |
| | Cleaning each 165 h | 9.9.5 | Cleaning the Longitudinal Section with Water |
| | | 9.9.6 | Cleaning the Sliver Feed |
| | Cleaning each 330 h | 9.9.7 | Cleaning the Lap Belt and the Deflection Rollers |
| | Cleaning each 2 000 h | 9.9.11 | Cleaning the Sliver Feed with Water |
| | Cleaning each 4 000 h | 9.9.15 | Cleaning the Conical Filter |
| Maintenance Personnel | Cleaning each 660 h | 9.9.8 | Cleaning the Coupling of the Main Motor and the Calender Drive |
| | Cleaning each 2 000 h | 9.9.9 | Cleaning the Internal Spaces of the Longitudinal Section |
| | | 9.9.10 | Cleaning the Fan Wheel of the Main Motor |
| | | 9.9.12 | Cleaning the Belt Control Mechanism |
| | | 9.9.13 | Cleaning the Bearing Bushings |
| | | 9.9.14 | Cleaning the Frequency Converter Housing |
| | Cleaning each 4 000 h | 9.9.16 | Cleaning the Fan |

## 9.6 Lubrication Table by Cycle

| Target group | Lubrication cycle | Additional information | |
|---|---|---|---|
| Operator | Lubrication each 330 h | 9.10.4 | Lubricating the Piston Rods of the Lap Disk Cylinder |
| Maintenance Personnel | Lubrication each 330 h | 9.10.2 | Lubricating the Bearings of the Bottom Rollers |
| | | 9.10.3 | Lubricating the Bearing Bushings of the Top Rollers |
| | Lubrication each 2 000 h | 9.10.5 | Lubricating the Calender Roller Bearings |
| | | 9.10.6 | Lubricating the Drive Shaft |
| | | 9.10.7 | Lubricating the Tension Arm Roller |
| | | 9.10.8 | Lubricating the Tension Lever |
| | | 9.10.9 | Lubricating the Coupling for the Longitudinal Section |
| | | 9.10.10 | Lubricating the Lap Disk Bearings |
| | | 9.10.11 | Lubricating the Belt Control Mechanism |
| | Lubrication each 4 000 h | 9.10.12 | Lubricating the Bearing of the Drive Shaft |
| | | 9.10.13 | Lubricating the Belt Drives G – H |
| | | 9.10.14 | Lubricating the Tension Rollers |
| | | 9.10.15 | Lubricating the Universal Shaft of the Table Calender Drive |
| | Lubrication each 8 000 h | 9.11.5 | Changing the Oil of the Gear Motor |

## 9.7 Inspection Table by Cycle

| Target group | Inspection cycle | Additional information | |
|---|---|---|---|
| Inspector | Inspection for wear parts | 9.11.9 | Examining the Rubber Cot Surfaces of the Top Rollers |
| | | 9.11.10 | Examining the Rubber Cot Wear of the Top Rollers |
| | | 9.11.11 | Examining the Drafting System Wipers |
| | | 9.11.12 | Examining the Gas Pressure Spring of the Drafting System |
| | | 9.11.13 | Examining the Conical Filter |
| | | 9.11.14 | Examining the Table Calender Wipers |
| | | 9.11.15 | Examining the Loading Elements |
| | Inspection each 165 h | 9.11.1 | Visually Examining the Operating Position of the Lap Belt |

| Target group | Inspection cycle | Additional information | |
|---|---|---|---|
| | Inspection each 660 h | 9.11.3 | Examining if the Belt Is in the Center of the Pulley |
| | | 9.11.4 | Examining the Belt Operation |
| | | 10.3.1.22 | Tightening the Toothed Belt |
| | Inspection each 8 000 h | 9.11.6 | Examining the Air Gap at the Coupling When the Coupling Is Closed |
| | | 9.11.7 | Examining the Air Gap at the Coupling When the Coupling Is Open |
| | | 9.11.8 | Adjusting the Proximity Switch at the Table Calender |

## 9.8 Maintenance Work After Commissioning

This section contains information about the maintenance work that is necessary after commissioning of the machine. After this maintenance period, some of the maintenance work is necessary be done again in accordance with different maintenance intervals.

### Maintenance Work before Start-up

| Component Name | Task | Reference |
|---|---|---|
| Coupling for the longitudinal section | Lubricate the coupling for the longitudinal section | *Refer to ▸ 322* |
| Calender module | Lubricate the calender roller bearings | *Refer to ▸ 318* |
| Lap disks | Lubricate the piston rods of the lap disk cylinder | *Refer to ▸ 318* |
| | Lubricate the lap disk bearings | *Refer to ▸ 323* |
| Drive roller | Lubricate the drive shaft | *Refer to ▸ 319* |
| Belt control gearing | Lubricate the belt control mechanism | *Refer to ▸ 324* |
| Tension lever | Lubricate the tension lever | *Refer to ▸ 321* |
| Tension roller | Lubricate the tension arm roller | *Refer to ▸ 320* |
| Drive of the longitudinal section | Lubricate the bearing of the drive shaft | *Refer to ▸ 325* |
| Drafting system drive | Lubricate the tension rollers | *Refer to ▸ 327* |

| Component Name | Task | Reference |
|---|---|---|
| | Lubricate the belt drives G – H | *Refer to ▶ 326* |
| Bottom rollers of the drafting system | Lubricate the bearings of the bottom rollers | *Refer to ▶ 316* |
| Bearing bushings | Lubricate the bearings of the top rollers | *Refer to ▶ 317* |

### Interval after Each 330 Operating Hours

| Component Name | Task | Reference |
|---|---|---|
| Bearing bushings | Clean the bearing bushings | *Refer to ▶ 309* |
| | Lubricate the bearings of the top rollers | *Refer to ▶ 317* |

## 9.9 Cleaning Tasks

This chapter contains information about how to clean the machine.

### 9.9.1 Cleaning the Longitudinal Section

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ A roller picker is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean all hoods, covers, and the edges of the web table.
4. Clean the sliver guide and do not break the sliver.
5. If the drafting system is dirty, open the loading arm to clean the parts with the roller picker.
6. Clean the table calender with the roller picker.
7. Turn the suction tube 1 until the wiper 2 is at the top.

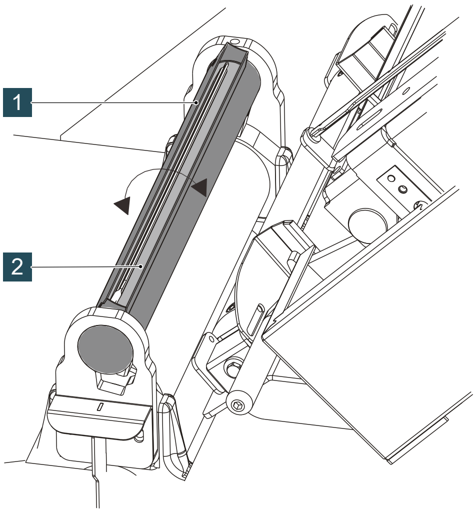

*Figure 282: Suction tube*

8. Clean the wiper 2 and the suction tube 1.
9. Turn the suction tube 1 back to the work position.
10. Pull out the drawers 4.

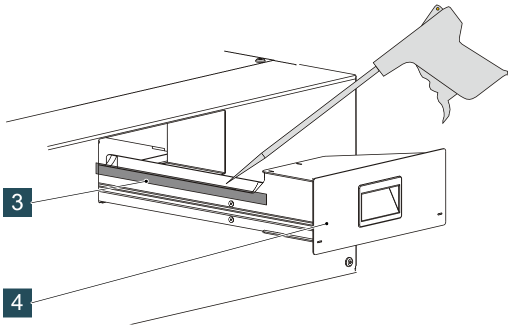

*Figure 283: Drawers*

11. Clean the table calender wipers 3 with the roller picker.
12. Clean the drawers 4.
13. Push back the drawers 4.
14. Open the flap 6 of the drafting system.

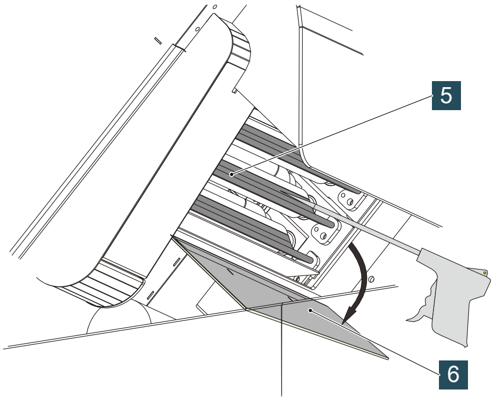

*Figure 284: Drafting system wipers*

15. Clean the wipers 5 with the roller picker.
16. Clean the filter 7 without liquids.

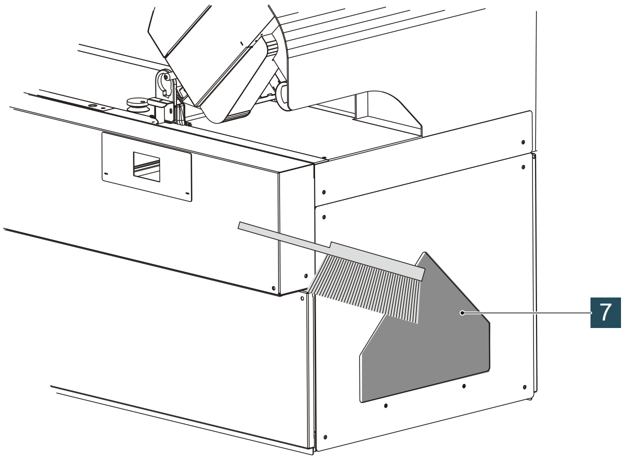

*Figure 285: Filter*

**Result** The longitudinal section is cleaned.

### 9.9.2 Cleaning the Calender Roller Wipers

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Pull out the 4 calender roller wipers to the side.
4. Clean the 4 calender roller wipers.

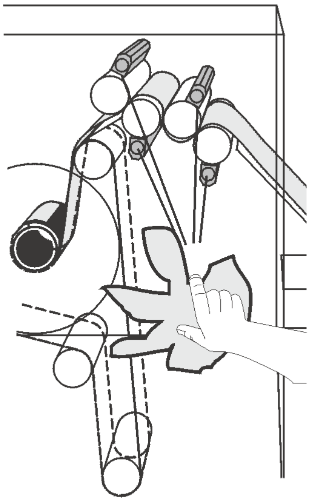

*Figure 286: Cleaning of the calender roller wipers*

5. Install the calender roller wipers.

**Result** The calender roller wipers are cleaned.

### 9.9.3 Cleaning the Batt Guide Area

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Open the right doors.
4. Clean the batt guide area 2 with a vacuum cleaner.

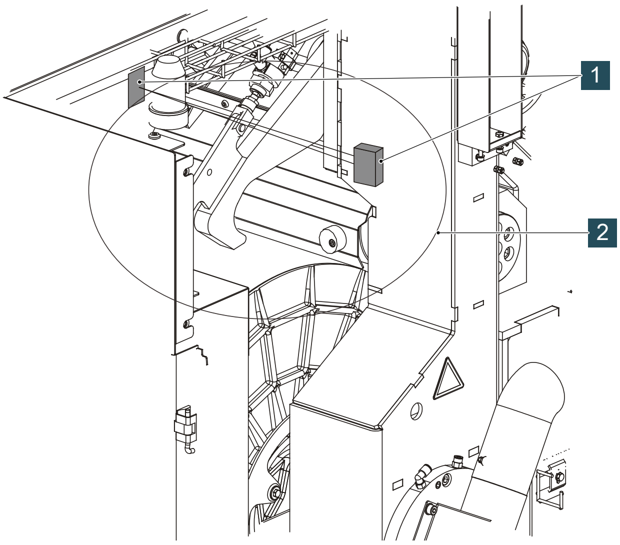

*Figure 287: Batt guide area*

5. Clean the light barrier 1 and the sensor.

**Result** The batt guide area is cleaned.

### 9.9.4 Cleaning the Waste Chamber of the Fiber Separator

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Open the waste chamber door 1.

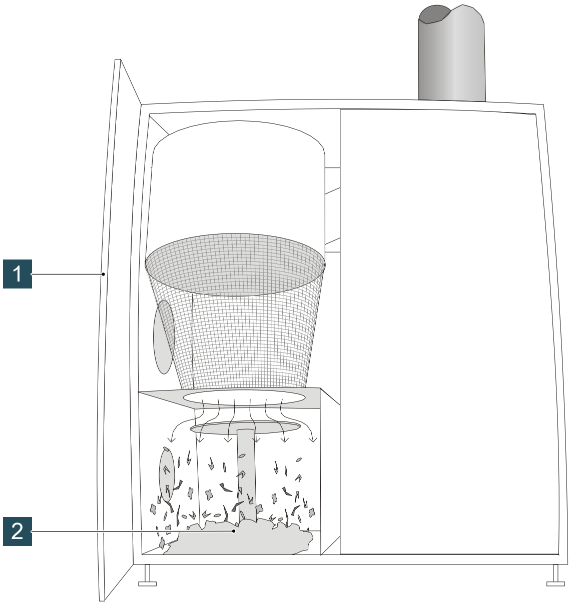

*Figure 288: Waste chamber*

2. Remove the waste 2 manually.
3. Close the waste chamber door 1.

**Result** The waste chamber of the fiber separator is cleaned.

### 9.9.5 Cleaning the Longitudinal Section with Water

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the material from the web table 4 and from the drafting system.

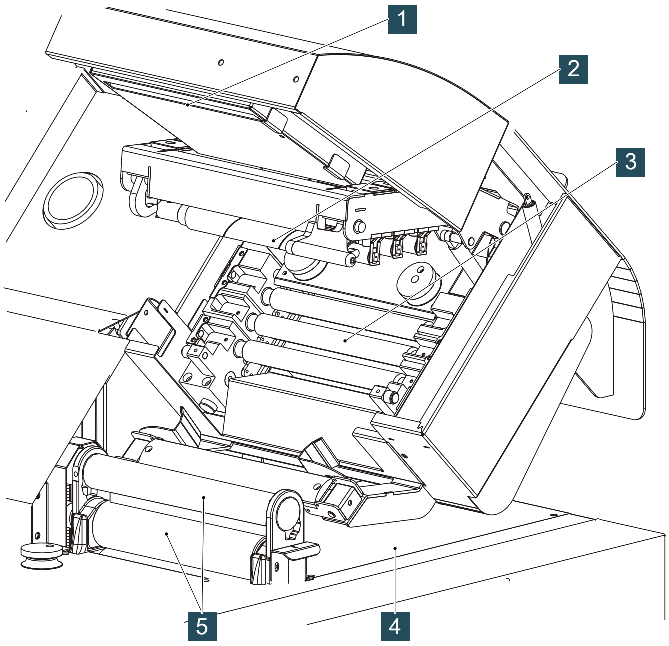

*Figure 289: Longitudinal section*

4. Remove the bottom roller wipers.
5. Remove the top roller wipers.
6. Remove the top rollers 2.
7. Clean the web table 4 and the table calender 5.
8. Turn the suction tube of the table calender until the wiper is at the top.
9. Clean the table calender wipers with water.
10. Turn the suction tube of the table calender back to the work position.
11. Clean the bottom rollers 3 with water.
12. Clean the top rollers 2 with water.
13. Clean the bottom roller wipers with water.
14. Clean the top roller wipers with water.
15. Clean the suction slots of the hood 1 with water.
16. Clean the suction unit below the drafting system with water.
17. Dry and polish all components that were cleaned.
18. Install all the removed components to the correct position.

**Result** The longitudinal section is cleaned.

### 9.9.6 Cleaning the Sliver Feed

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean all sliver guide elements 1 but do not remove the sliver.

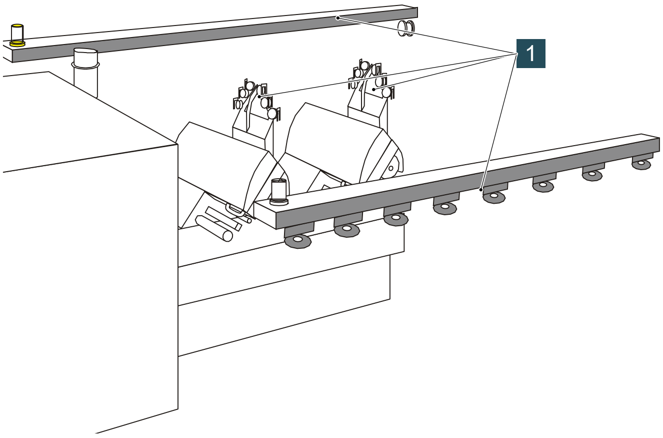

*Figure 290: Sliver feed*

4. Remove the collected fibers.

**Result** The sliver feed is cleaned.

### 9.9.7 Cleaning the Lap Belt and the Deflection Rollers

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The tension arm is at the bottom position.
- ✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean the lap belt with a vacuum cleaner and a roller picker.
4. To clean the surface of the lap belt that faces the lap, use a moist cloth.
5. To polish the surface of the lap belt that faces the lap, use a dry cloth.
6. Clean the 6 deflection rollers with a moist cloth.

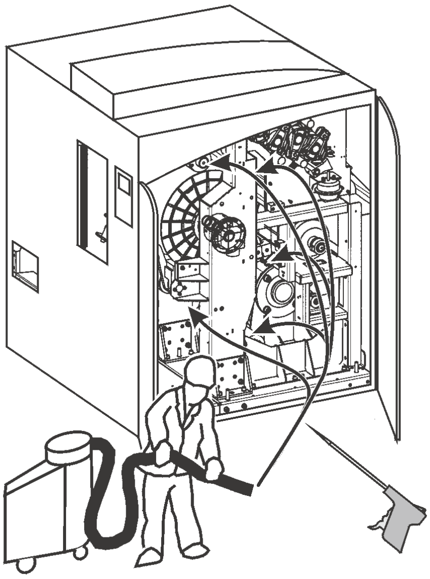

*Figure 291: Deflection rollers*

7. Polish the 6 deflection rollers with a dry cloth.
8. Clean the surfaces 1 and 2.

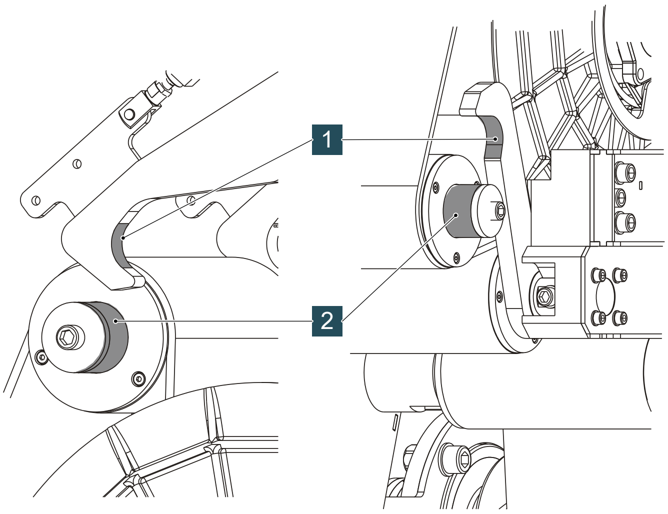

*Figure 292: Surface of deflection rollers*

**Result** The lap belt and the deflection pulleys are cleaned.

### 9.9.8 Cleaning the Coupling of the Main Motor and the Calender Drive

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

**CAUTION**

**Uncontrolled release of compressed air!**

Eye injury

▶ Always put on the safety glasses when you use the compressed air.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean the outer section of the coupling 1 with a vacuum cleaner.

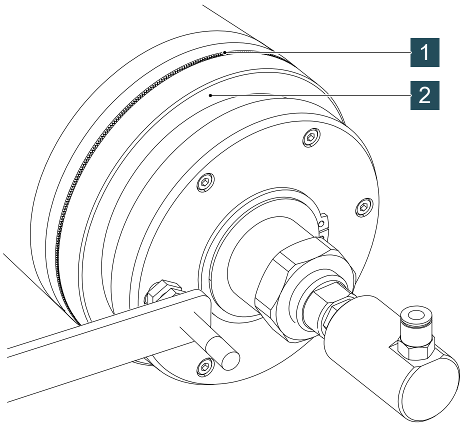

*Figure 293: Coupling of the main motor and the calender drive*

4. **CAUTION! Compressed air! Risk of eye injury because of the compressed air. → Always wear the safety glasses when you use the compressed air.** Clean the gearings 2 with the compressed air.

**Result** The coupling of the main motor and the calender drive is cleaned.

### 9.9.9 Cleaning the Internal Spaces of the Longitudinal Section

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Open all hoods.
4. Remove all covers 1.

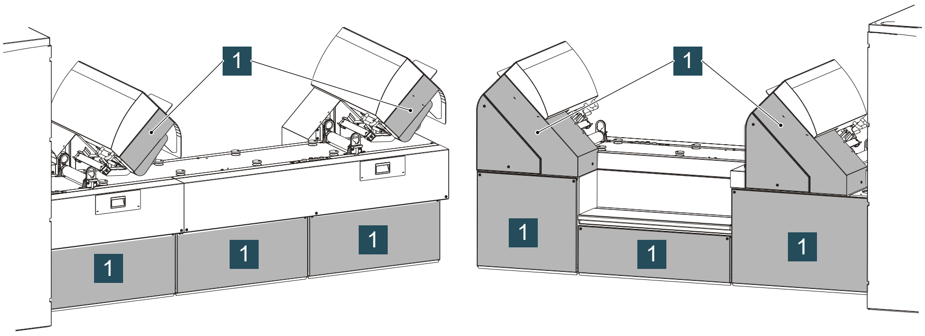

*Figure 294: Left side and right side of the longitudinal section*

5. Clean the inner spaces with a vacuum cleaner.
6. Install all covers 1.
7. Close all hoods.

**Result** The internal spaces of the longitudinal section are cleaned.

## 9.9.10 Cleaning the Fan Wheel of the Main Motor

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Make a mark on the belt.

   ⇨ The belt can be installed at the same position.
4. Loosen the toothed belt.
5. Loosen the bolts 1.

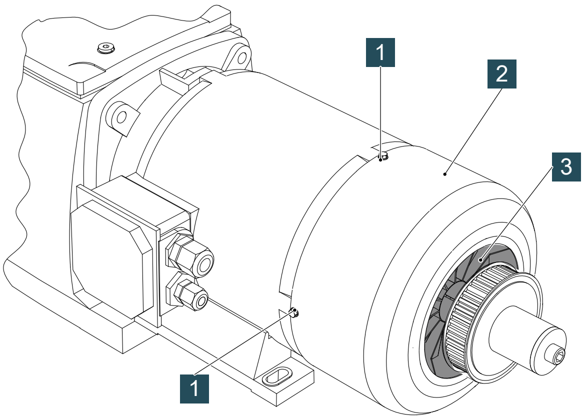

*Figure 295: Fan wheel on the main motor*

6. Pull out the hood 2 as far as possible.
7. Clean the fan wheel 3, the fins, and the hood.
8. Install the hood 2.

9. Install the toothed belt.

**Result** The fan wheel of the main motor is cleaned.

### 9.9.11 Cleaning the Sliver Feed with Water

**Prerequisites** Make sure that the criteria are obeyed:

✓ The cans are empty.

1. Remove the sliver from the creel.
2. Remove the cans.
3. Clean all of the frame with a vacuum cleaner.

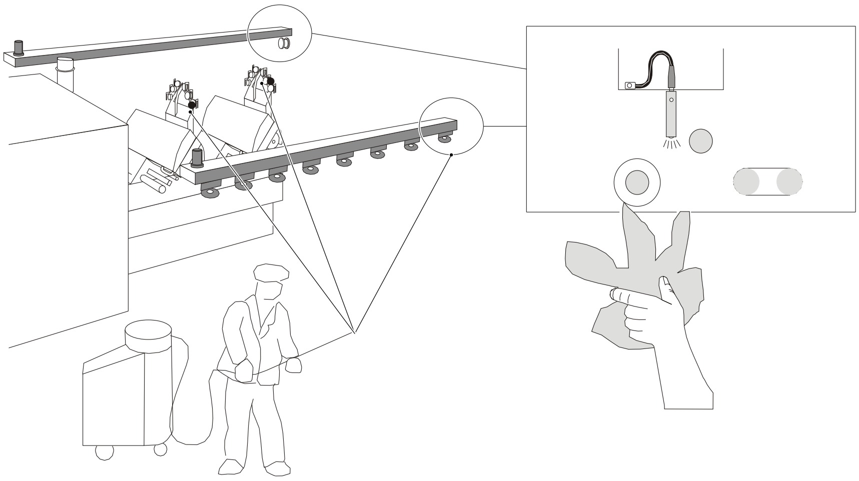

*Figure 296: Sliver feed cleaning*

4. Clean all the sliver guide elements with water.
5. Put the cans back to the correct position.
6. Put the slivers to the creel.

**Result** The sliver feed is cleaned with water.

### 9.9.12 Cleaning the Belt Control Mechanism

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean the sensor 1.

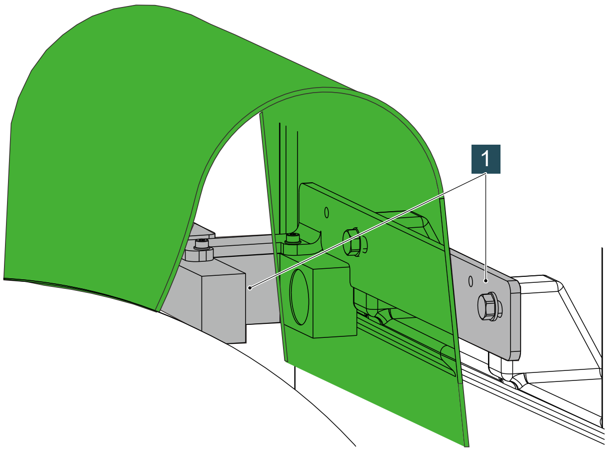

*Figure 297: Sensor for the belt control mechanism*

4. Clean the transmission housing for the belt control mechanism.
5. Remove the housing cover that hides the toothed belt.
6. Clean the toothed belt 2.

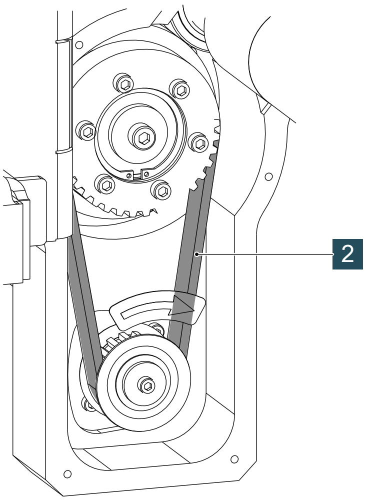

*Figure 298: Toothed belt*

**Result** The belt control mechanism is cleaned.

### 9.9.13 Cleaning the Bearing Bushings

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the bearing bushings.

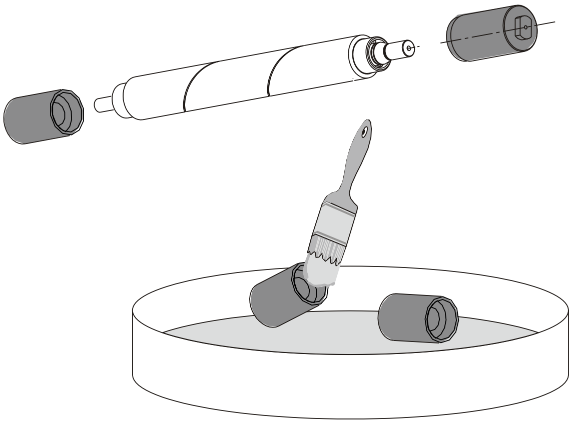

*Figure 299: Bearing bushings cleaning*

4. Clean the bearing bushings in a 9:1 mixture of petrol and oil.

**Result** The bearing bushings are cleaned.

### 9.9.14 Cleaning the Frequency Converter Housing

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean the surface of the frequency converter housing with a vacuum cleaner.

**Result** The frequency converter housing is cleaned.

### 9.9.15 Cleaning the Conical Filter

1. Remove the conical filter.
2. Clean the conical filter in the washing machine.
3. Clean the inner area with a moist cloth.

**Result** The conical filter is cleaned.

### 9.9.16 Cleaning the Fan

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Hold the motor 3.

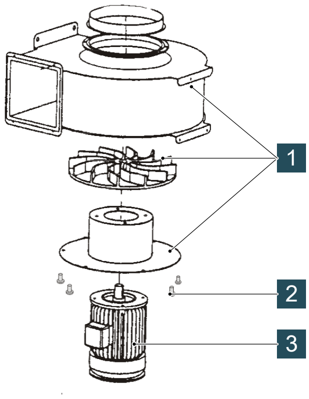

*Figure 300: Fan*

4. Loosen the bolts 2.

   ⇨ The motor and the fan parts 1 can now be removed.

5. Remove the motor and the fan parts 1.
6. Clean the fan parts 1 with water.

**Result** The fan is cleaned.

## 9.10 Lubrication Tasks

This chapter contains information about the lubrication tasks of the machine.

**CAUTION**

**Incorrect storage and incorrect operation of the lubricants**

Irritation or burns to skin, eyes, or respiratory tract

Risk of slipping are spilled

- ▶ Read the safety data sheet.
- ▶ Use safety gloves and safety glasses.
- ▶ Do NOT touch hot lubricants.
- ▶ Clean up the lubricants that flow out.

## 9.10.1 Lubrication Points

### 9.10.1.1 Lap Head

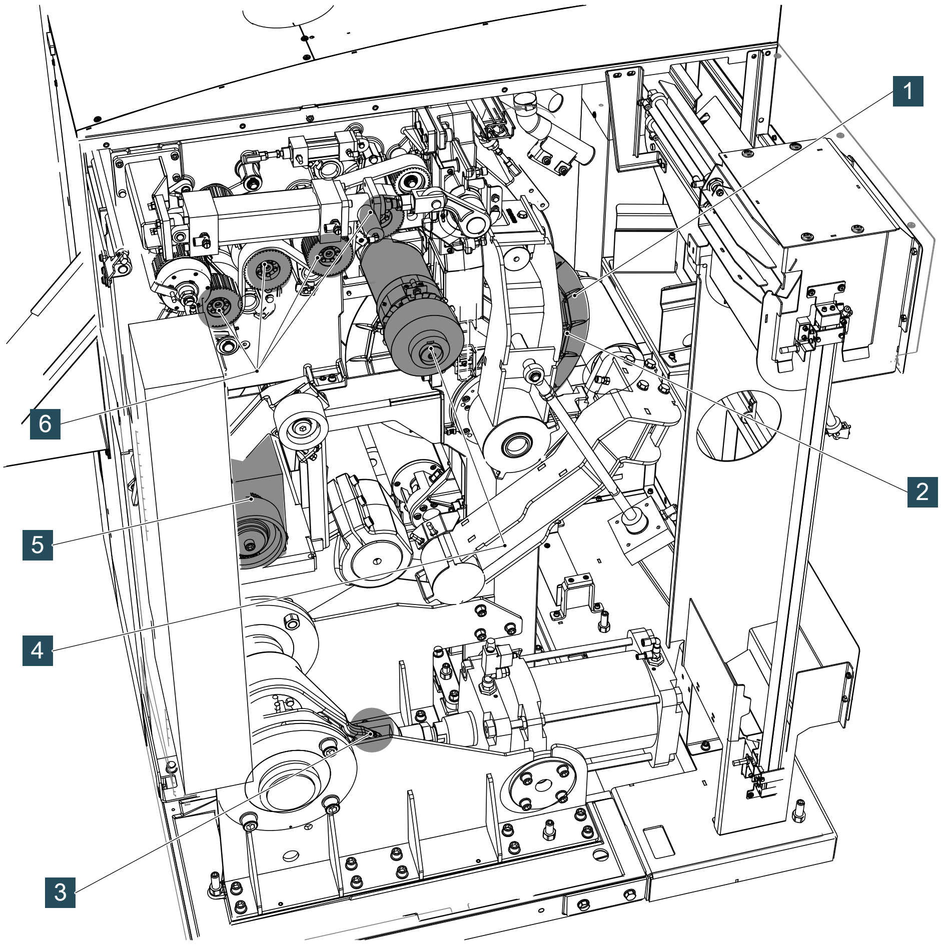

*Figure 301: Lubrication points at the left side of the lap head*

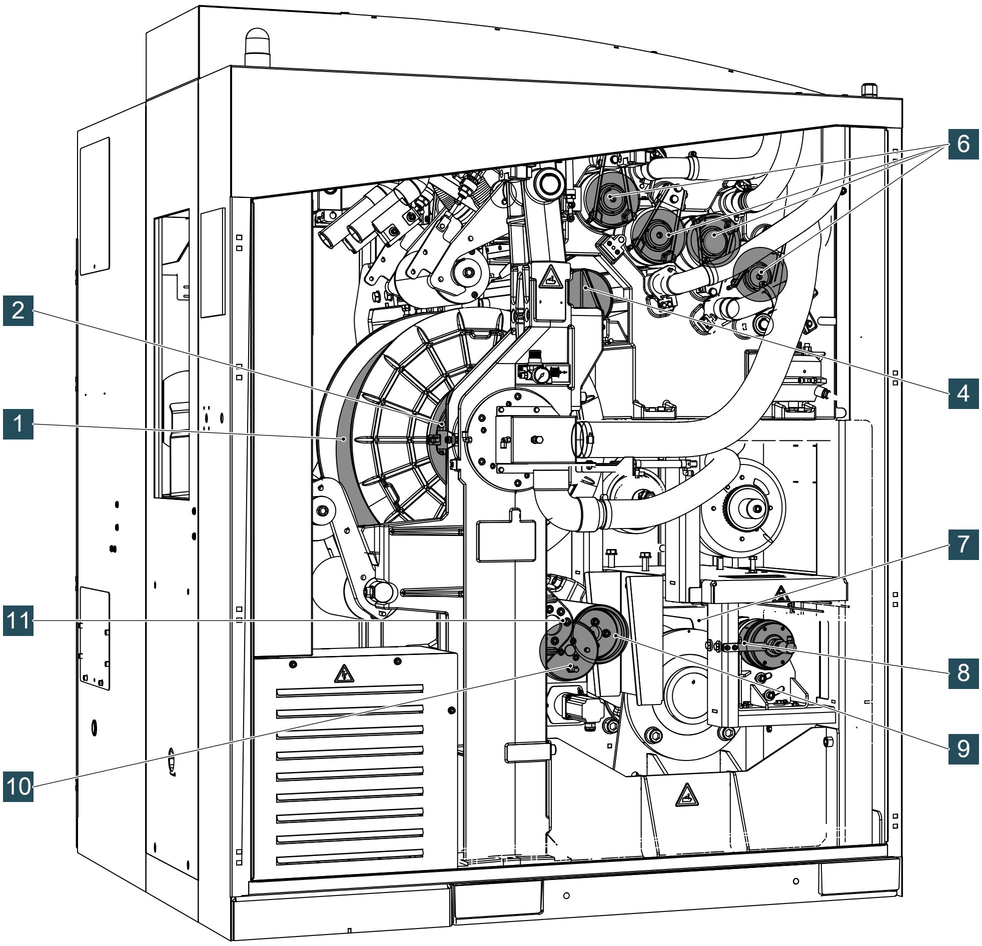

*Figure 302: Lubrication points at the right side of the lap head*

| Location | Number of Lubricating Nipples | Lubricants | Quantity of the Lubricants | Tools | Reference |
|---|---|---|---|---|---|
| 1 Lap disk bearings | 2 | EP 2 | 2 – 3 strokes | Grease gun adapter for recessed lubricating nipples | *Refer to ▶ 323* |
| 2 Piston rods of the lap disk cylinder | 2 | CC 150 | 2 – 3 drops | -- | *Refer to ▶ 318* |

| Location | Number of Lubricating Nipples | Lubricants | Quantity of the Lubricants | Tools | Reference |
|---|---|---|---|---|---|
| 3 Tension lever | 1 | EP 2 | 2 – 3 strokes | Grease gun adapter for tapered lubricating nipples | *Refer to ▸ 321* |
| 4 Drive shaft | 2 | EP 2 | 5 – 6 strokes | Grease gun adapter for tapered lubricating nipples | *Refer to ▸ 319* |
| 5 Gear motor | 1 | CLP PG 220 | 5 liter | Oil hose | *Refer to ▸ 333* |
| 6 Calender roller bearings | 8 | EP 2 | 2 – 3 strokes | Grease gun adapter for tapered lubricating nipples | *Refer to ▸ 318* |
| 7 Lubricating nipple behind the coupling of the longitudinal section | 1 | EP 2 | 2 – 3 strokes | Grease gun adapter for tapered lubricating nipples | *Refer to ▸ 322* |
| 8 Lubricating nipple of the coupling of the longitudinal section | 1 | EP 2 | 2 – 3 strokes | Grease gun adapter for recessed lubricating nipples | *Refer to ▸ 322* |
| 9 Tension arm roller | 1 | EP 2 | 5 – 6 strokes | Grease gun adapter for tapered lubricating nipples | *Refer to ▸ 320* |
| 10 Bottom part of the belt control mechanism | 1 | EP 2 | 2 strokes | Grease gun adapter for tapered lubricating nipples | *Refer to ▸ 324* |

| Location | Number of Lubricating Nipples | Lubricants | Quantity of the Lubricants | Tools | Reference |
|---|---|---|---|---|---|
| 11 Top part of the belt control mechanism | 1 | EP 2 | 3 strokes | Grease gun adapter for tapered lubricating nipples | *Refer to ▸ 324* |

### 9.10.1.2 Drafting System

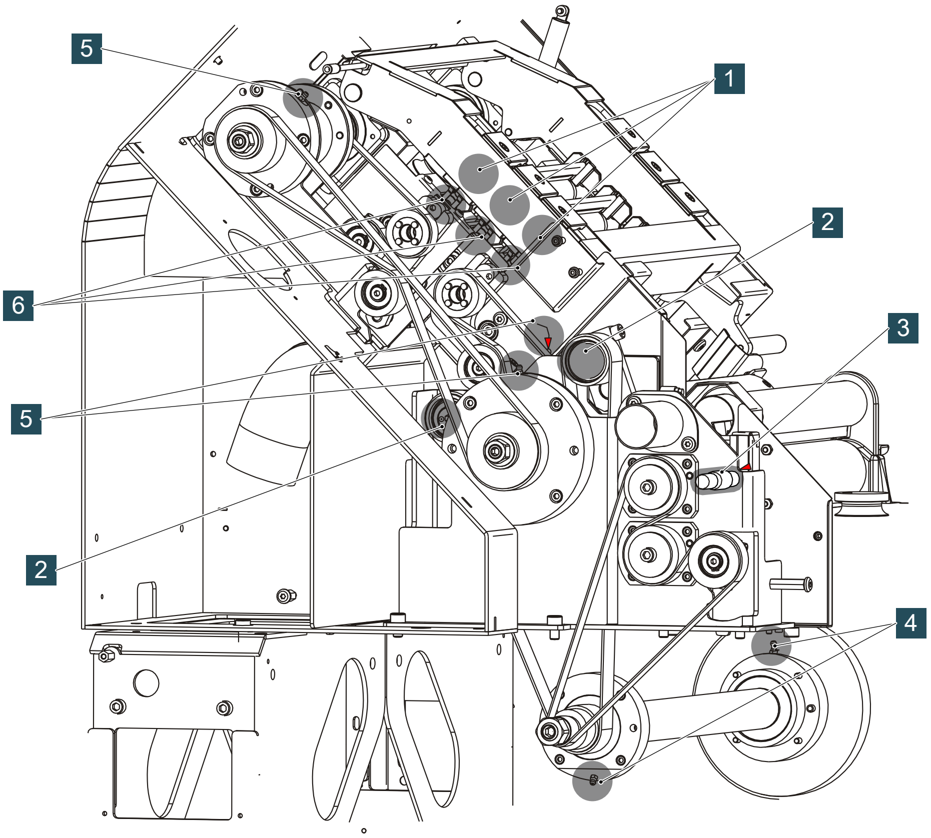

*Figure 303: Lubrication points at the drafting system*

| Location | Number of Lubricating Nipples | Lubricants | Quantity of the Lubricants | Tools | Reference |
|---|---|---|---|---|---|
| 1 Bearing bushings of the top rollers | 2 × 3 × 2 | EP 2 | 2 – 3 strokes | Grease gun adapter for bearing bushing | *Refer to ▸ 317* |

| Location | Number of Lubricating Nipples | Lubricants | Quantity of the Lubricants | Tools | Reference |
|---|---|---|---|---|---|
| 2 Tension rollers | 2 × 2 | EP 2 | 1 – 2 strokes | Grease gun adapter for recessed lubricating nipples | *Refer to ▶ 327* |
| 3 Universal shaft of the table calender drive | 2 × 2 | EP 2 | 1 stroke | Grease gun adapter for recessed lubricating nipples | *Refer to ▶ 328* |
| 4 Bearings of the drive shaft | 2 × 2 | EP 2 | 3 – 4 strokes | Grease gun adapter for tapered lubricating nipples | *Refer to ▶ 325* |
| 5 Belt drives (G – H) | 2 × 3 | EP 2 | 2 – 3 strokes | Grease gun adapter for tapered lubricating nipples | *Refer to ▶ 326* |
| 6 Bearings of the bottom rollers | 2 × 3 × 2 | EP 2 | 2 – 3 strokes | Grease gun adapter for recessed lubricating nipples | *Refer to ▶ 316* |

### 9.10.2 Lubricating the Bearings of the Bottom Rollers

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for recessed lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Open the drafting system hood.
4. Open the loading arm.
5. Clean the lubricating nipples 1.

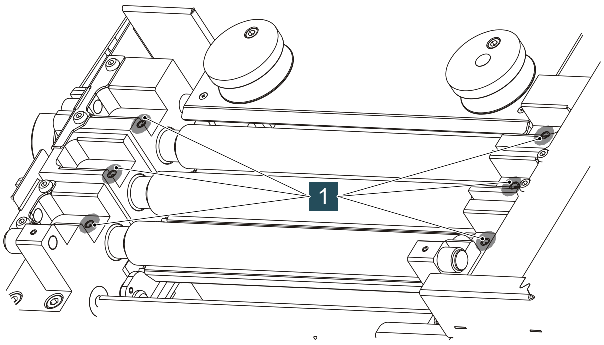

*Figure 304: Bearings of the bottom rollers*

6. To apply 2 – 3 strokes of the lubricant EP 2 to the lubricating nipples 1, use a grease gun adapter for recessed lubricating nipples
7. Clean the lubricating nipples 1 again.
8. Pull the loading arm down.
9. Close the drafting system hood.

**Result** The bearings of the bottom rollers are lubricated.

### 9.10.3 Lubricating the Bearing Bushings of the Top Rollers

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for bearing bushing is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the top rollers.
4. To apply 2 – 3 strokes of the lubricant EP 2 to the bearing bushings 1, use a grease gun adapter for bearing bushing.

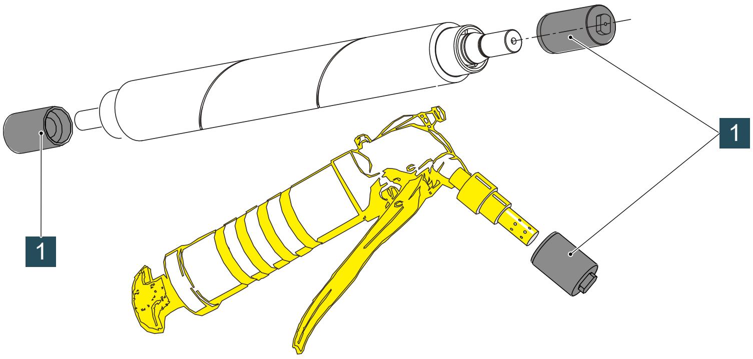

*Figure 305: Bearing bushings of the top rollers*

**Result** The bearing bushings of the top rollers are lubricated.

### 9.10.4 Lubricating the Piston Rods of the Lap Disk Cylinder

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant CC 150 is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Apply 2 – 3 drops of the lubricant CC 150 to the inner and outer section of the piston rod 1 that is on the right side.

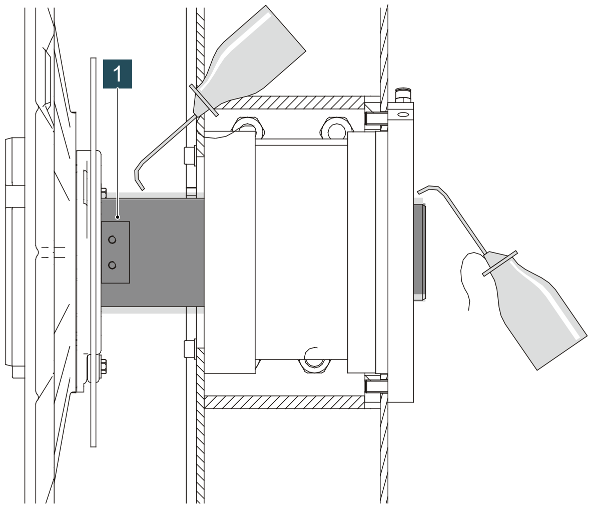

*Figure 306: Piston rods of the lap disk cylinders*

4. Apply 2 – 3 drops of the lubricant CC 150 to the piston rod that is on the left side.

**Result** The piston rods of the lap disk cylinders are lubricated.

### 9.10.5 Lubricating the Calender Roller Bearings

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for tapered lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Open the right doors.
4. Clean the lubricating nipples 1 at the right door side.

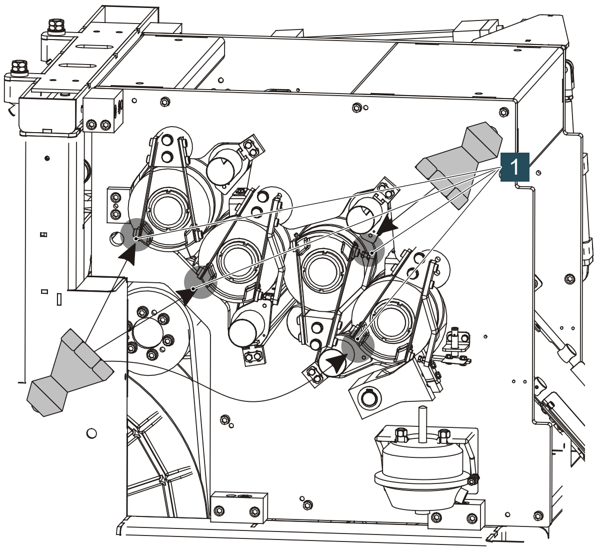

*Figure 307: Lubrication of the calender roller bearings*

5. To apply 2 – 3 strokes of the lubricant EP 2 to each lubricating nipple 1, use a grease gun adapter for tapered lubricating nipples.
6. Clean the lubricating nipples 1 at the right door side again.
7. Open the left doors and the right doors.
8. Do the steps 2 to 4 again for the lubricating nipples at the left door side.

**Result** The calender roller bearings are lubricated.

## 9.10.6 Lubricating the Drive Shaft

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for tapered lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean the lubricating nipple 2 on the right side.

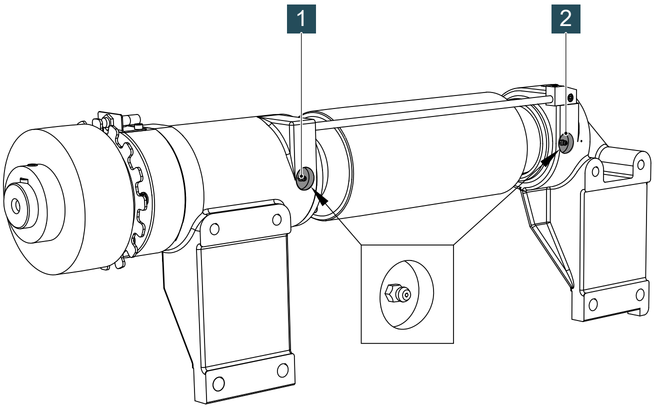

*Figure 308: The drive shaft bearing*

4. To apply 5–6 strokes of the lubricant EP 2 to the lubricating nipple 2, use a grease gun adapter for tapered lubricating nipples.
5. Clean the lubricating nipple 2 again.
6. Clean the lubricating nipple 1 on the left side.
7. To apply 5–6 strokes of the lubricant EP 2 to the lubricating nipple 1, use a grease gun adapter for tapered lubricating nipples.
8. Clean the lubricating nipple 1 again.

**Result** The drive shaft is lubricated.

### 9.10.7 Lubricating the Tension Arm Roller

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for tapered lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean the lubricating nipple 1.

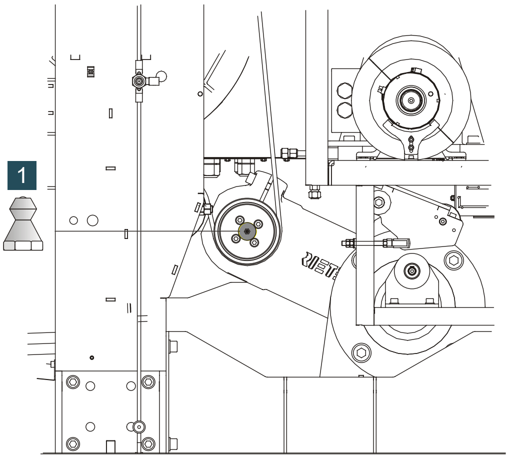

*Figure 309: Tension arm roller*

4. To apply 5 – 6 strokes of the lubricant EP 2 to the lubricating nipple 1, use a grease gun adapter for tapered lubricating nipples.
5. Clean the lubricating nipple 1 again.

**Result** The tension arm roller is lubricated.

### 9.10.8 Lubricating the Tension Lever

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The operator has access to the lubricating nipple.
- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for tapered lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean the lubricating nipple 1.

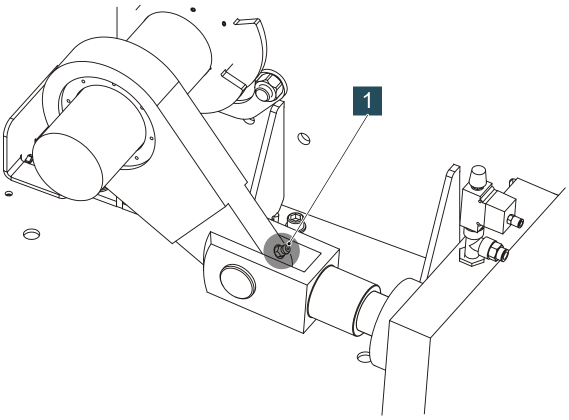

*Figure 310: The tension lever*

4. To apply 2 – 3 strokes of the lubricant EP 2 to the lubricating nipple 1, use a grease gun adapter for tapered lubricating nipples.
5. Clean the lubricating nipple 1 again.

**Result** The tension lever is lubricated.

### 9.10.9 Lubricating the Coupling for the Longitudinal Section

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for recessed lubricating nipples is necessary.
- ✓ The grease gun adapter for tapered lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Open the right doors.
4. Clean the lubricating nipple 1.

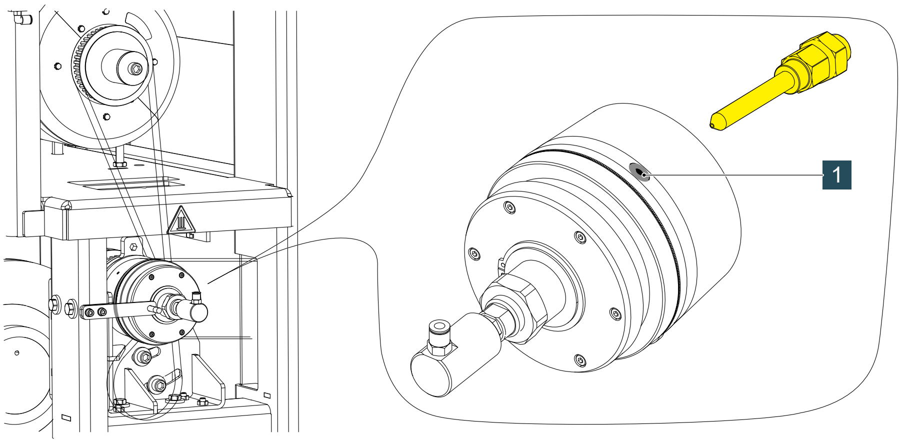

*Figure 311: Lubricating nipple at the pulley*

5. To apply 2 – 3 strokes of the lubricant EP 2 to the lubricating nipple 1, use a grease gun adapter for recessed lubricating nipples.
6. Clean the lubricating nipple 1 again.
7. Clean the lubricating nipple 2.

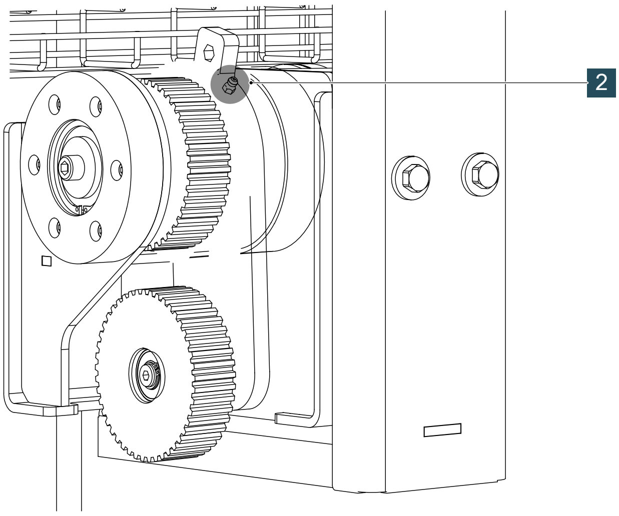

*Figure 312: The nipple behind coupling for the longitudinal section*

8. To apply 2 – 3 strokes of the lubricant EP 2 to the lubricating nipple 2, use a grease gun adapter for tapered lubricating nipples.
9. Clean the lubricating nipple 2 again.

**Result** The coupling of the longitudinal section is lubricated.

## 9.10.10 Lubricating the Lap Disk Bearings

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for recessed lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean the lubricating nipple 1 on the right side.

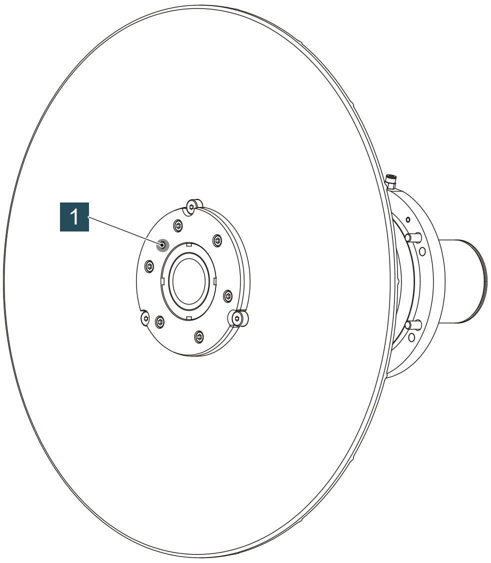

*Figure 313: Lap disk bearings*

4. To apply 2 – 3 strokes of the lubricant EP 2 to the lubricating nipple 1 on the right side, use a recess nipple adaptor for the grease gun.
5. Clean the lubricating nipple 1 on the right side again.
6. Do the steps 3 – 5 again for the lubricating nipple on the left side.

**Result** The lap disk bearings are lubricated.

### 9.10.11 Lubricating the Belt Control Mechanism

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The belt control mechanism stops at the 0 position.
- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for tapered lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Clean the lubricating nipple 1.

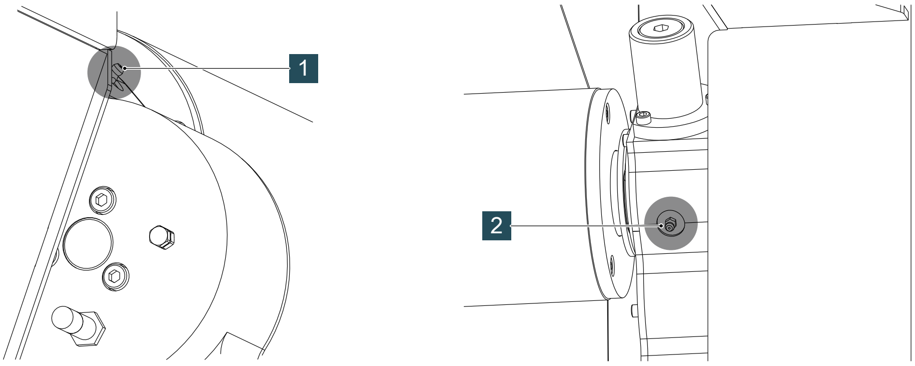

*Figure 314: Belt control mechanism*

4. To apply 3 strokes of the lubricant EP 2 to the lubricating nipple 1, use a grease gun adapter for tapered lubricating nipples.
5. Clean the lubricating nipple 1 again.
6. Clean the lubricating nipple 2.
7. To apply 2 strokes of the lubricant EP 2 to the lubricating nipple 2, use a grease gun adapter for tapered lubricating nipples.
8. Clean the lubricating nipple 2 again.
9. Examine if the belt control mechanism moves smoothly.

**Result** The belt control mechanism is lubricated.

### 9.10.12 Lubricating the Bearing of the Drive Shaft

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for taper lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the covers 1.

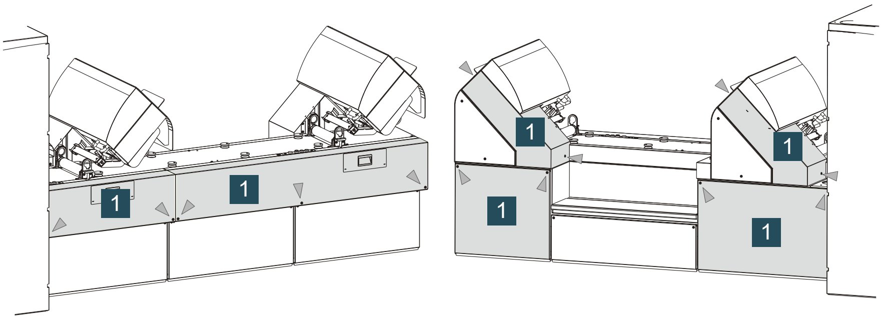

*Figure 315: Covers*

4. Clean the lubricating nipples 2.

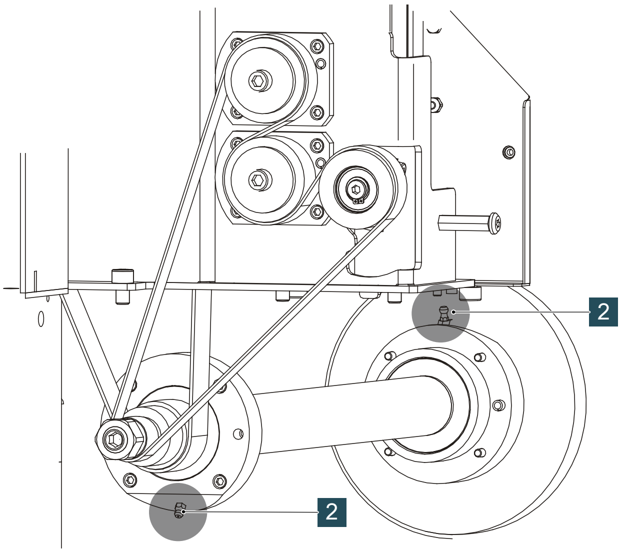

*Figure 316: Bearings of the drive shaft*

5. To apply 3 – 4 strokes of the lubricant EP 2 to the lubricating nipples 2, use a grease gun adapter for tapered lubricating nipples.
6. Clean the lubricating nipples 2 again.
7. Install the removed covers.

**Result** The bearings of the drive shaft are lubricated.

### 9.10.13 Lubricating the Belt Drives G – H

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for taper lubricating nipples is necessary.

**WARNING**

**Moving belts**

Drive belts without covers cause injury to the hands.

- ▶ Do **NOT** touch the moving belts.
- ▶ Do adjustment only when the machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the covers 1.

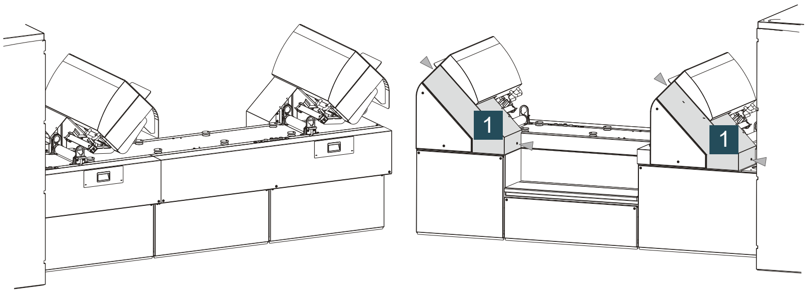

*Figure 317: Covers_2*

4. **WARNING! Moving belts! Drive belts without covers cause injury to the hands**. Clean the lubricating nipples 2.

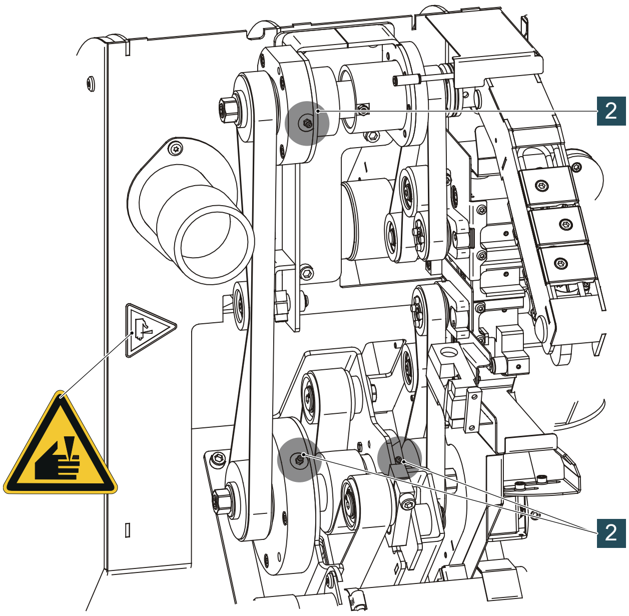

*Figure 318: Belt drives G – H*

5. To apply 2 – 3 strokes of the lubricant EP 2 to the lubricating nipples 2, use the grease gun adapter for tapered lubricating nipples.
6. Clean the lubricating nipples 2 again.

**Result** The belt drives G – H are lubricated.

## 9.10.14 Lubricating the Tension Rollers

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for recessed lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the covers 1.

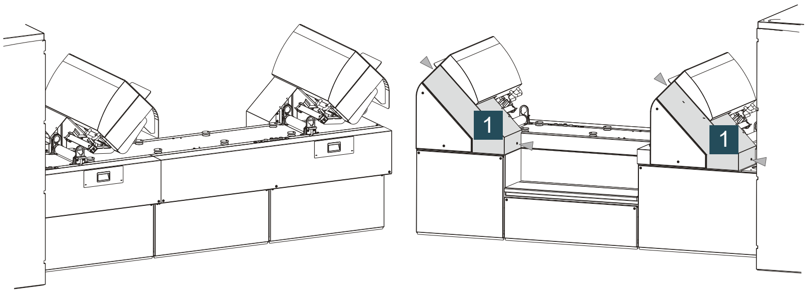

*Figure 319: Covers_2*

4. Clean the lubricating nipples 2.

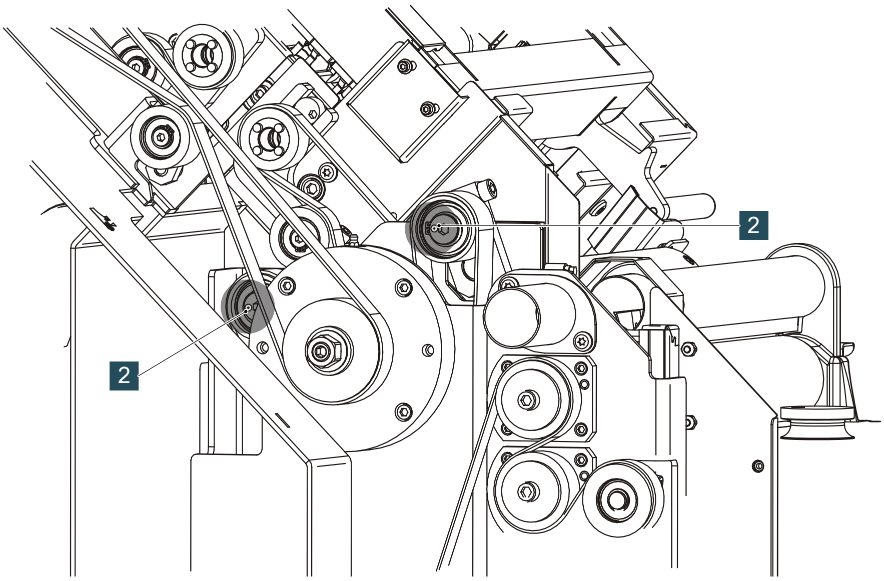

*Figure 320: Tension rollers*

5. To apply 1 – 2 strokes of the lubricant EP 2 to the lubricating nipples 2, use the grease gun adapter for recessed lubricating nipples
6. Clean the lubricating nipples 2 again.

**Result** The tension rollers are lubricated.

### 9.10.15 Lubricating the Universal Shaft of the Table Calender Drive

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The universal shaft is removed.
- ✓ The machine is at a standstill.
- ✓ The lubricant EP 2 is necessary.
- ✓ The grease gun adapter for recessed lubricating nipples is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the rubber bellow 2 on the 2 sides.

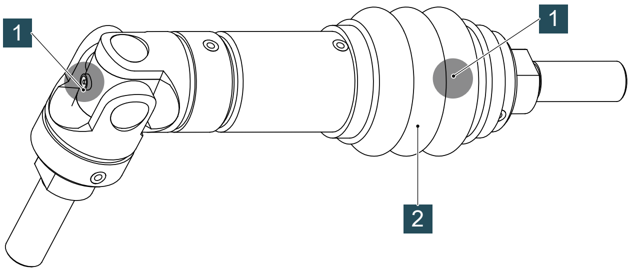

*Figure 321: Universal shaft of the table calender*

4. Clean the lubricating nipples 1 on the 2 sides.
5. To apply 1 stroke of the lubricant EP 2 to the lubricating nipples 1, use the grease gun adapter for recessed lubricating nipples
6. Clean the lubricating nipples 1 again.
7. Install the rubber bellow 2 on the 2 sides.
8. Install the universal shaft.

**Result** The universal shaft of the table calender drive is lubricated.

## 9.11 Inspection Tasks

This chapter contains information about the inspection tasks of the machine.

### 9.11.1 Visually Examining the Operating Position of the Lap Belt

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is in operation.

1. Monitor the lap belt with a flashlight from the front during the lap build-up procedure.
2. Examine lap belt at the points 1, 2 and 3.

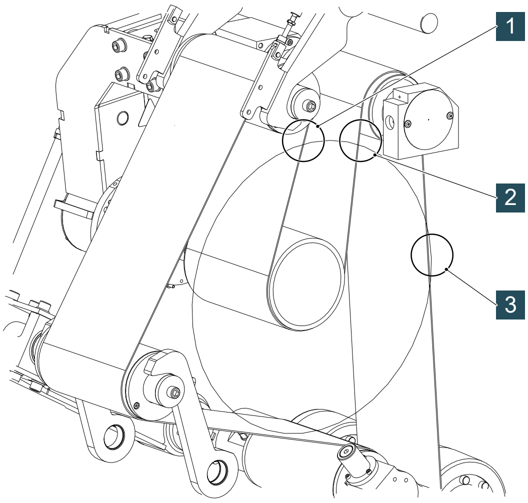

*Figure 322: Operating position of the lap belt*

3. Examine if there is a vibration at the lap belt.
4. After the lap change, stop the machine when the lap length is 50 m.
5. Open the right side door.
6. Examine the edges 4 and 5 of the lap belt.

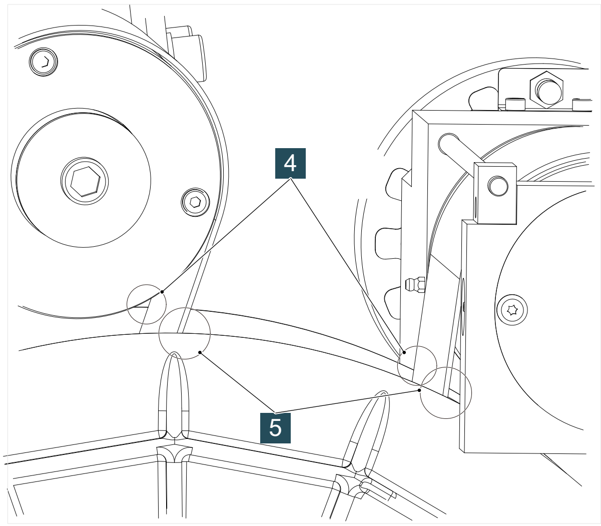

*Figure 323: Edges of the lap belt*

**Result** The operating position of the lap belt is examined visually.

## Procedure after the Visual Inspection

If the lap belt is in the center position between the lap disks, the lap belt is in a good condition.

If the lap belt touches the lap disks but not too much, set the target position of the lap belt (*refer to* ▸ *195*).

If the lap belt touches the lap disk tightly, the procedures to adjust the belt are as follows:

- Clean the lap belt and the deflection rollers (*refer to* ▸ *304*).
- Examine the holding position of the opener arm pawls (*refer to* ▸ *186*).
- Adjust the belt control (*refer to* ▸ *190*).

If the lap belt does not go gradually, the procedures to adjust the belt are as follows:

- Clean the lap belt and the deflection rollers (*refer to* ▸ *304*).
- Remove the belt to examine if the lap belt is broken (*refer to* ▸ *360*).

### 9.11.2 Examining the Belt Tension

| Marking on Belt 1 | |
|---|---|
| Slack | 1 000 mm |
| Taut | 1 006.5 mm |

| Marking on Belt 2 | |
|---|---|
| Slack | 400 mm |
| Taut | 403.2 mm |

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Check the tension of belt 2.

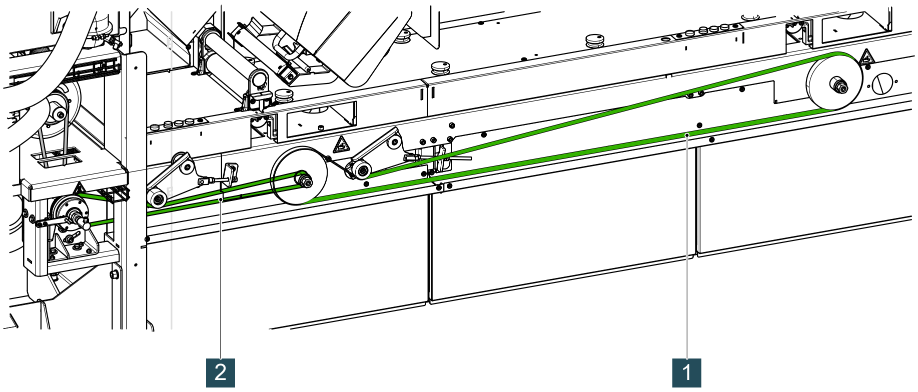

*Figure 324: Belts of the longitudinal section*

4. If the distance between the two markings is not 403.2 mm long when the belt is tightened, set the belt tension of the belt 2.
5. Check the tension of belt 1.
6. If the distance between the two markings is not 1 006.5 mm long when the belt is tightened, set the belt tension of the belt 1.
7. Unlock the main switch.
8. Set the main switch to the position ON.

**Result** The belt tension is examined.

### 9.11.3 Examining if the Belt Is in the Center of the Pulley

## WARNING

**Moving belts**

Drive belts without covers cause injury to the hands.

- ▶ Do **NOT** touch the moving belts.
- ▶ Do adjustment only when the machine is at a standstill.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. **WARNING! Moving belts! Drive belts without covers cause injury to the hands.** Remove the cover that hides the belt.
4. Examine if distance A is the same to the distance B.

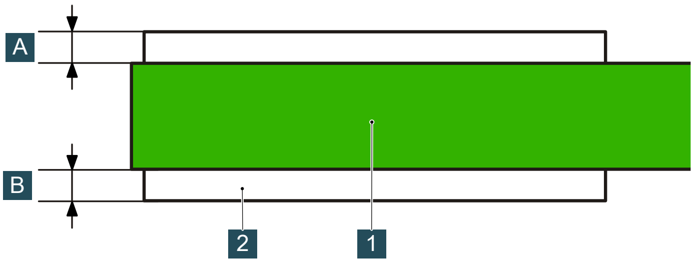

*Figure 325: Top view of the belt*

| | | | |
|---|---|---|---|
| 1 | The belt | 2 | The pulley |

5. If the distance A is not the same to the distance B, adjust the belt 1 (*refer to ▸ 221*).

**Result** The center situation of the belt is examined.

### 9.11.4 Examining the Belt Operation

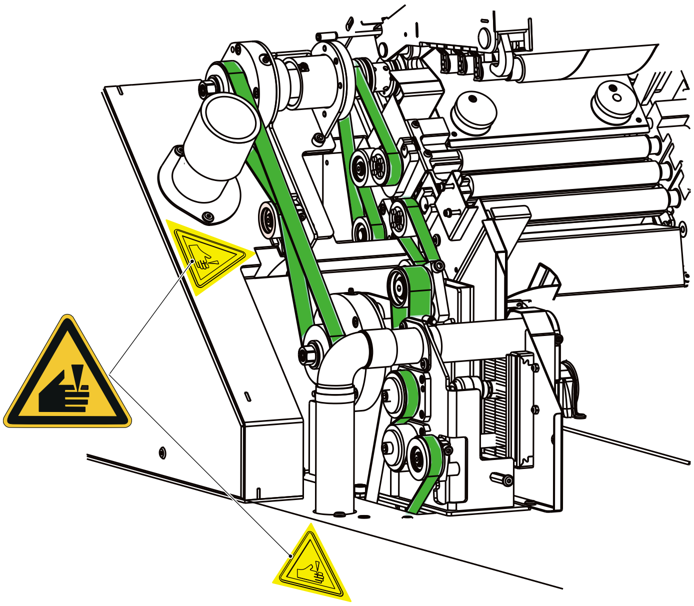

*Figure 326: Belt at the drafting system*

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The main switch is set to the position OFF and the main switch is padlocked.

> **WARNING**
>
> **Moving belts**
>
> Drive belts without covers cause injury to the hands.
>
> ▶ Do **NOT** touch the moving belts.
>
> ▶ Do adjustment only when the machine is at a standstill.

1. **WARNING! Moving belts! Drive belts without covers cause injury to the hands.** Remove the cover that is outside the belts.
2. Examine the alignment of the belt.
3. If one of the belts does not run in the center of the pulley, adjust the belt (*refer to* ▶ *221*).
4. If one of the belts is worn out, replace the belt (*refer to* ▶ *373*).

### 9.11.5 Changing the Oil of the Gear Motor

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The oil CLP PG 220 is necessary.
- ✓ The oil hose is necessary.

1. Set the main switch to the position OFF.

2. Padlock the main switch.
3. Clean the pipe couplings 1 and 6 with a cloth.

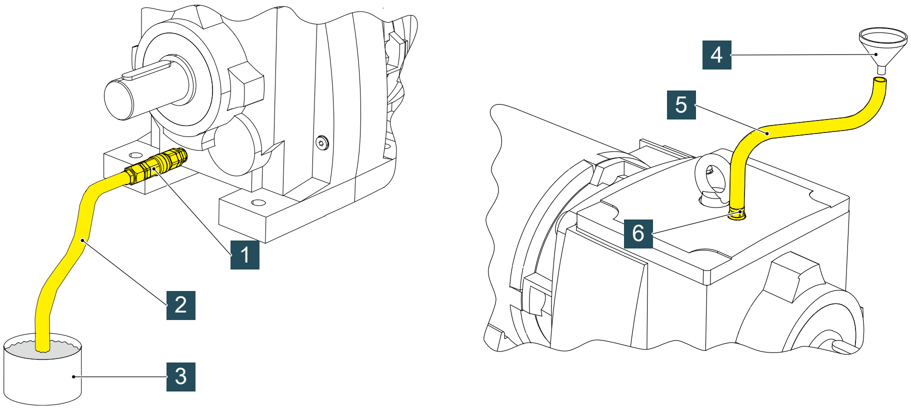

*Figure 327: Oil change*

4. Put a container 3 at the right side of the machine.
5. Connect the oil hose 2 to the pipe coupling 1.
6. Connect the oil hose 5 to the pipe coupling 6.
   ⇨ The used oil flows into the container 3.
7. Wait until all of the waste oil is in the container 3.
8. Disconnect the oil hose 2.
9. Clean the pipe coupling 1 again with a cloth.
10. Put a funnel 4 into the hose 5 and hold the funnel.
11. Put 5 liters of the oil CLP PG 220 into the funnel 4.
12. Disconnect the oil hose 5.
13. Clean the pipe coupling 6 again with a cloth.

**Result** The oil of the gear motor is changed.

### 9.11.6 Examining the Air Gap at the Coupling When the Coupling Is Closed

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.
✓ A vacuum cleaner is necessary.

1. Clean the coupling with the vacuum cleaner.
2. To examine if the air gap X is in the range of 0.7 mm to 0.8 mm, check with a feeler gauge.

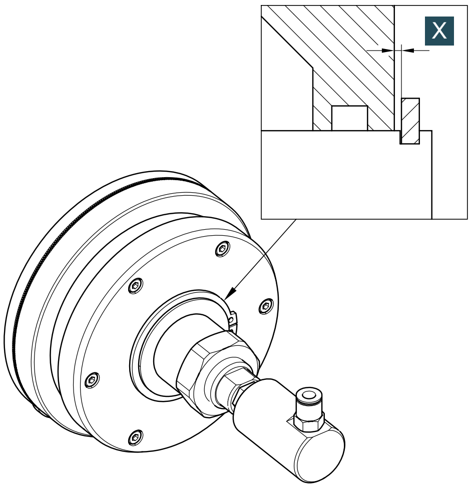

*Figure 328: The air gap distance in a closed condition*

3. If the air gap X is not in the range from 0.7 mm to 0.8 mm, adjust the coupling.

**Result** The air gap at the coupling in a closed condition is examined.

## 9.11.7 Examining the Air Gap at the Coupling When the Coupling Is Open

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ A vacuum cleaner is necessary.

1. Select the **Service mode** in the data screen 80.1.
2. Open the coupling through the service function in the data screen 82.1.
3. Clean the coupling with the vacuum cleaner.
4. To examine if the air gap Y is 0.2 mm, check with a feeler gauge.

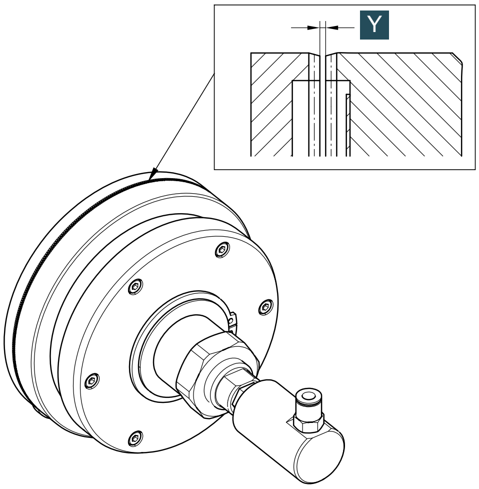

*Figure 329: Air gap at coupling in open condition*

5. If the air gap Y is not 0.2 mm, adjust the coupling.

**Result** The air gap at the coupling in an open condition is examined.

### 9.11.8 Adjusting the Proximity Switch at the Table Calender

| | |
|---|---|
| Calender roller lift 1 mm | LED on |
| Calender roller lift 2 mm | LED off |

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Pull out the drawer below the table calender.
4. Remove the web from the table calender.
5. Set the distance X between the proximity switch 4 and the piece 3 to 2 mm.

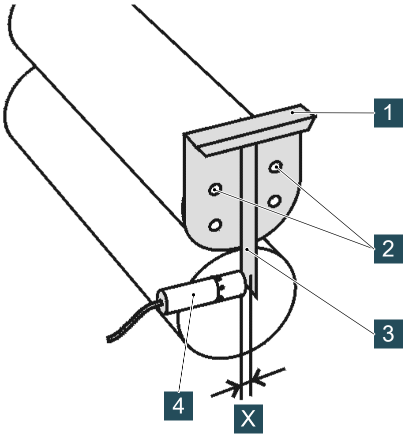

*Figure 330: Proximity switch at the table calender*

6. Loosen the screws 2.
7. Move the top calender cylinder 6 1 mm away from the bottom calender cylinder 5.

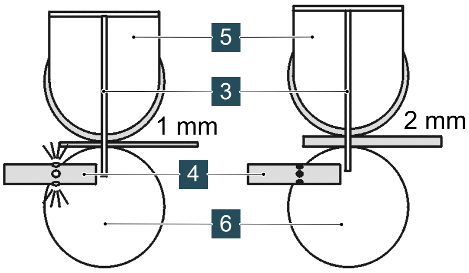

*Figure 331: Side views of the proximity switch at the table calender*

8. Unlock the main switch.
9. Set the main switch to the position ON.
10. Examine if the LED indicator of the proximity switch 4 is on.
11. If the proximity switch 4 is off, loosen the screws 2.
12. Adjust the piece 3 to set the proximity switch 4 to be on.
13. Set the main switch to the position OFF.
14. Padlock the main switch.
15. Move the top calender cylinder 6 2 mm away from the bottom calender cylinder 5.
16. Unlock the main switch.
17. Set the main switch to the position ON.
18. Examine if the LED indicator of the proximity switch 4 is off.
19. If the proximity switch 4 is on, loosen the screw 2.
20. Adjust the piece 3 to set the proximity switch 4 to be off.
21. Tighten the screws 2.
22. Unlock the main switch.
23. Set the main switch to the position ON.

**Result** The proximity switch at the table calender is adjusted.

### 9.11.9 Examining the Rubber Cot Surfaces of the Top Rollers

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the top rollers.
4. Examine the rubber cot surface of the top rollers.
5. If the rubber cot surface is not good and with hairline cracks, do the grinding of the rubber cots of the top rollers.
6. Install the top rollers.

**Result** The rubber cot surfaces of the top rollers is examined.

### 9.11.10 Examining the Rubber Cot Wear of the Top Rollers

1. Remove the top rollers.
2. To measure the rubber cots diameter d at the center, use a caliper.

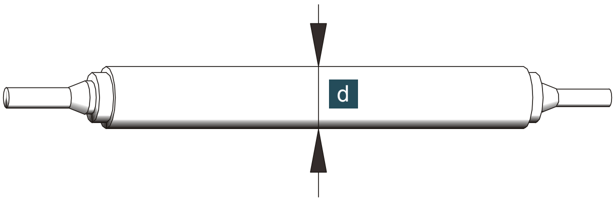

*Figure 332: Rubber cots diameter*

3. If the diameter d is less than 36 mm, replace the rubber cots.
4. Install the top rollers.

**Result** The rubber cot wear of the top rollers is examined.

## 9.11.11 Examining the Drafting System Wipers

Drafting system wipers contain top roller wipers and bottom roller wipers.

### Examining the Top Roller Wipers

1. Remove the top roller wipers 1.

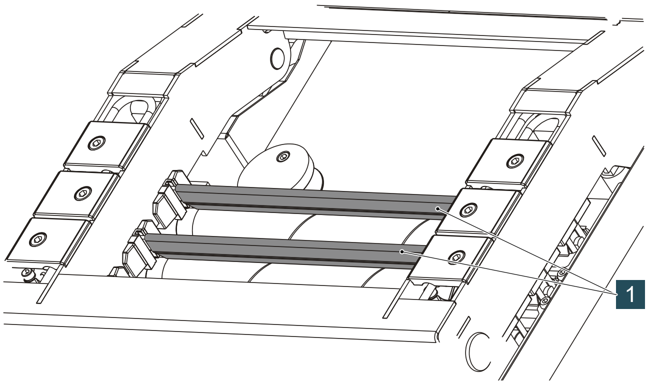

*Figure 333: Top roller wipers*

2. Examine the top roller wipers for the wear and damage.
3. If the top roller wipers are damaged, worn out, or not straight, replace the wipers.
4. Install the top roller wipers.

**Result** The top roller wipers of the drafting system are examined.

### Examining the Bottom Roller Wipers

1. Remove the bottom roller wipers 2.

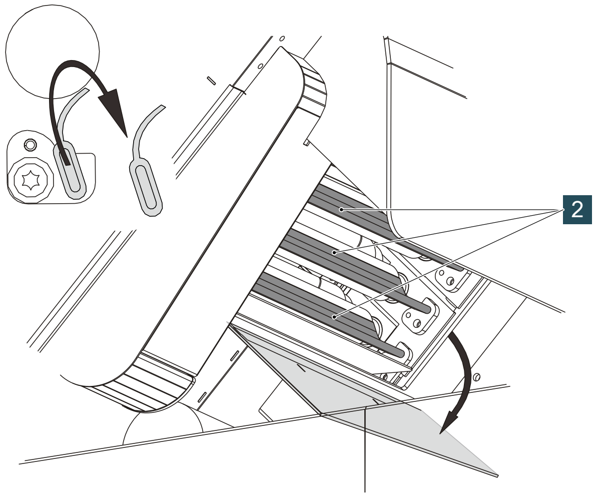

*Figure 334: Bottom roller wipers*

2. Examine the bottom roller wipers for the wear and damage.
3. If the bottom roller wipers are damaged, worn out, or not straight replace the wipers.
4. Install the bottom roller wipers.

**Result** The bottom roller wipers are examined.

## 9.11.12 Examining the Gas Pressure Spring of the Drafting System

1. Push the stop button.
2. Open the loading arm.
3. Examine if the loading arm opens by itself to the limit stop.
4. If the loading arm does not open by itself, replace the gas pressure spring 1.

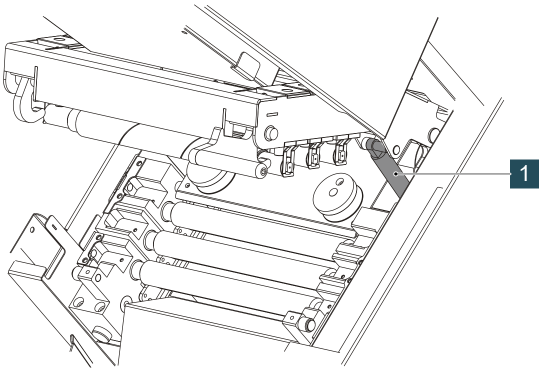

*Figure 335: Gas pressure spring of the drafting system*

5. Close the loading arm.

**Result** The gas pressure spring of the drafting system is examined.

### 9.11.13 Examining the Conical Filter

1. Examine if clamps 1 and 3 of the conical filter 2 are correctly tightened.

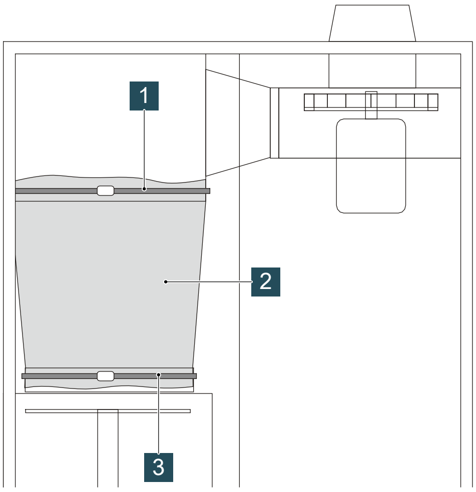

*Figure 336: The side view of the filter screen*

2. If the clamps 1 and 3 of the conical filter 2 are not tightened enough, tighten the clamps of the conical filter correctly.
3. Examine if the conical filter 2 is damaged.
4. If the conical filter 2 is damaged, loosen the clamps 1 and 3 to replace the conical filter.

**Result** The conical filter is examined.

### 9.11.14 Examining the Table Calender Wipers

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Pull out the drawer 1.

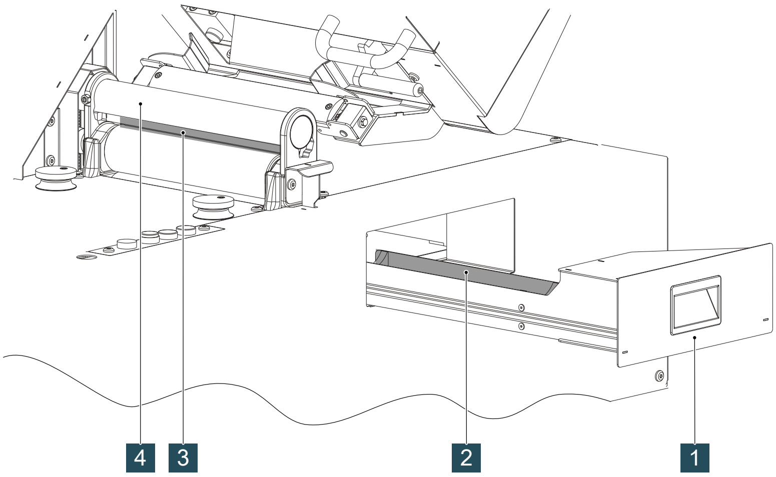

*Figure 337: Wipers for at the table calender*

4. Examine if the wiper 2 is straight, unworn, or elastic.
5. If the wiper 2 is not straight, or worn out, or not elastic, replace the wiper 2.
6. Push down the wiper 2 and close the drawer 1.
7. Turn the suction pipe 4 so the wiper 3 can be seen clearly.
8. Examine the wiper 3.
9. If the wiper 3 is not straight, or worn out, or not elastic, replace the wiper 3.
10. Turn the suction pipe 4 to the initial position.
11. Unlock the main switch.
12. Set the main switch to the position ON.

**Result** The table calender wipers are examined.

### 9.11.15 Examining the Loading Elements

1. Open the drafting system hood.
2. Push the jog button.
   ⇨ The load is applied to the drafting system for 10 seconds.
3. Listen if the air sound comes from the loading elements.
4. If air sound comes from the loading elements, replace the loading elements.

**Result** The loading elements are examined.

### 9.11.16 Replacing the Battery of the Control System

**Prerequisites** Make sure that the criteria are obeyed:

✓ The main switch is set to the position OFF and the main switch is padlocked.

## NOTICE

**Battery is replaced in de-energized condition**

The machine settings and shift data in the data memory are lost.

▶ Do NOT change the battery in the de-energized condition.

## NOTICE

**Static electricity!**

Damage to the electronic components

▶ Before work on electronic components, release the static electricity by touching the machine ground cable or other ground connections.

### Removing the Battery in the Control System

1. Remove the cover 2 with a screwdriver.

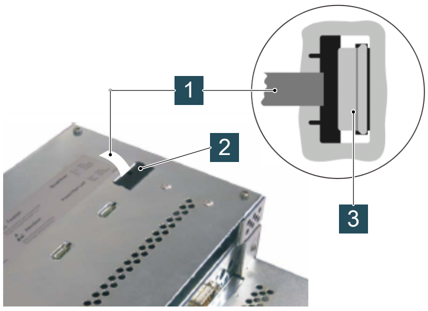

*Figure 338: Battery*

2. Pull out the strip 1.

⇨ The battery 3 is removed.

### Installing the Battery in the Control System

1. Put the strip 1 in the correct position in the battery compartment.

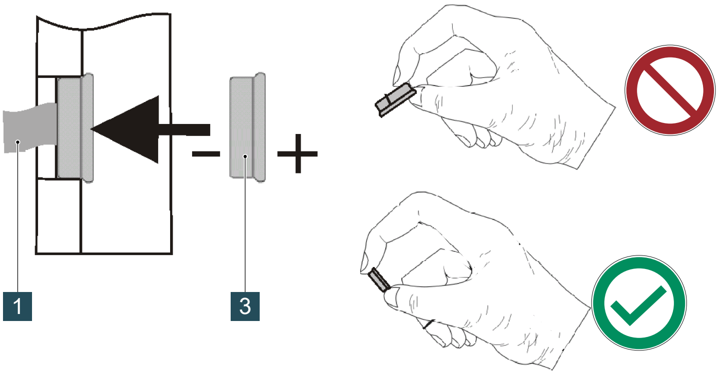

*Figure 339: Replace battery*

2. Do not touch the battery with non-insulated tools.
3. Hold the battery with 2 fingers on the side.
4. Put the new battery 3 into the battery compartment with the correct polarity.
5. Install the cover 2.

   ⇨ The battery 3 is installed.

**Result** The battery in the control system is replaced.

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# 10 Repair

This chapter contains information about the repair work of the machine.

More information about the electric devices and pneumatic devices is to be found in the electrical documentation.

## 10.1 Repair Personnel

Only Rieter-approved personnel are permitted to do the repair work at the machine.

## 10.2 Safety Regulations

The information that follows is the safety regulations that have to be obeyed:

- The machine is at a standstill.
- The main switch is set to the position OFF and the main switch is padlocked.

**Risks** The risks of injury to the personnel occur during the repair work because of:

- Human error
- Not using the personal protective equipment
- Not sufficient visual contact and communication with the personnel in the danger zone
- Electrical short-circuit

**DANGER**

**The safety devices are removed or bypassed!**

Death or dangerous injuries

▶ Do NOT remove the installed safety devices.

▶ Do NOT bypass the installed safety devices.

**WARNING**

**Turning parts!**

Risk of hand injury.

▶ Stay away from the machine until the machine is at a standstill.

## 10.3 Repair Work

This chapter contains information about how to repair the defective machine parts.

### 10.3.1 Lap Head

This section contains the information about the repair work of the lap head.

### 10.3.1.1 Replacing the Table Calender Wipers

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Loosen the bolts 1.

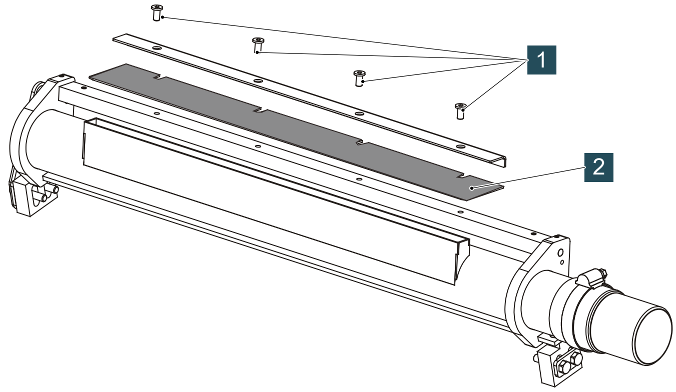

*Figure 340: Table calender wipers*

4. Pull out the wiper blade 2.
5. Put the new wiper blade at the correct position.
6. Tighten the bolts 1.

**Result** The table calender wipers are replaced.

### 10.3.1.2 Installing the Calender Roller Wipers

This section gives information about how to install the wipers of the 4 calender rollers.

The positions of the 4 wipers 1 2 3 and 4 of the calender rollers are shown in the figure that follows. The procedure that follows is the installation of the wiper 2 as an example.

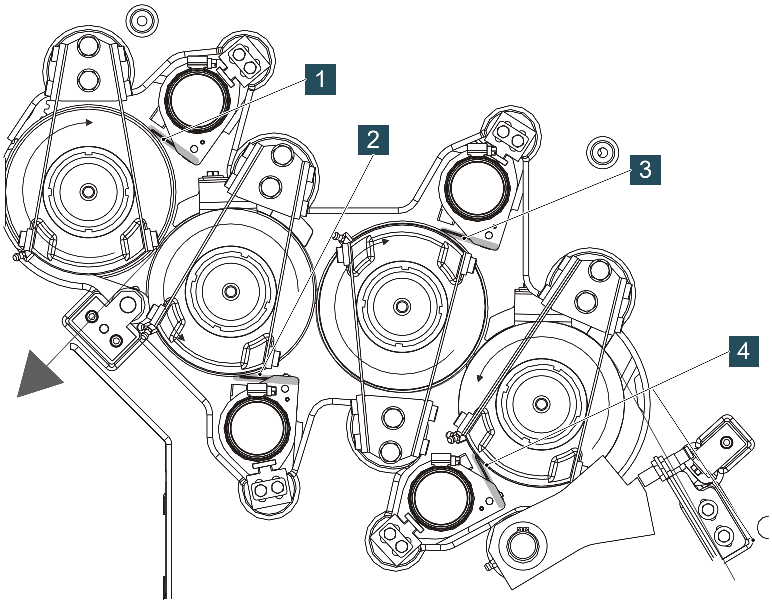

*Figure 341: Wipers of the calender rollers*

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Install the suction unit 5 to the guide rail 6.

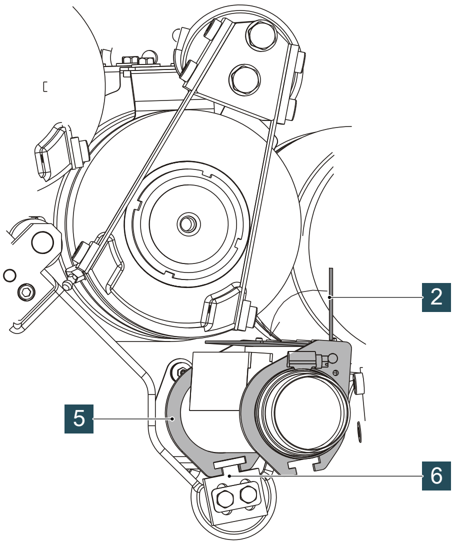

*Figure 342: Installation of the wiper of the calender roller*

4. Push down the wiper 2 and hold the wiper 2.
5. Put the suction unit 5.
6. Adjust the suction unit 5 on the other side to the guide rail 6.

7. Push the suction unit 5 until it engages.

**Result** The wiper of the calender roller is installed.

### 10.3.1.3 Removing the Lap Disks

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The shaft holder is necessary.
- ✓ The hook wrench is necessary.
- ✓ The pull-off device is necessary.

**WARNING**

**Falling machine components!**

Dangerous injuries by crushing of body parts

- ▶ Do NOT lift heavy components manually.
- ▶ Always use a safe and applicable lifting device.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the bracket 3 and the proximity switch.

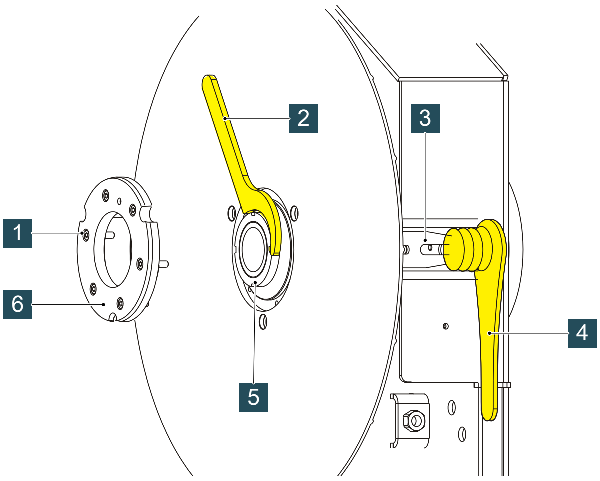

*Figure 343: Removal of the lap disk*

4. Remove the bolts 1 and the flange 6.
5. Put the shaft holder 4 into the lap disk shaft.
6. Tighten the clamping bolts at the shaft holder 4.
7. Hold the lap disk shaft with the shaft holder 4.
8. To loosen the grub screw at the edge of the slotted nut 5, use the hook wrench 2.
9. Install the pull-off device 8.

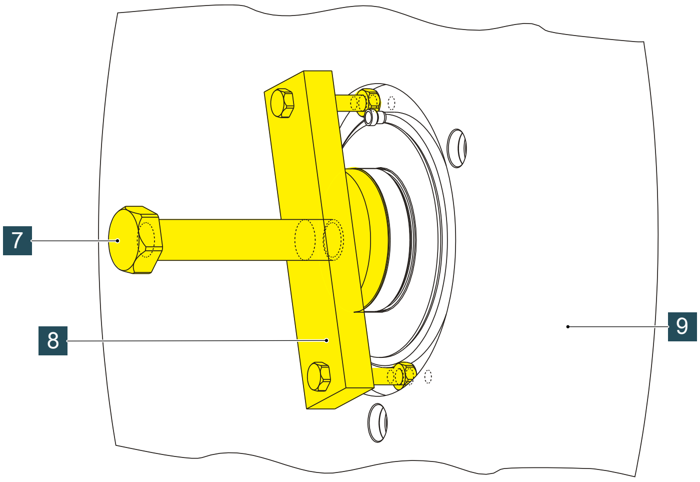

*Figure 344: Pull-off device*

10. Turn the bolt 7 clockwise.
11. **WARNING! Falling components! Dangerous injuries by crushing of the person.** Pull off the lap disk 9.
12. Do the steps 3 to 11 again for the lap disk on the other side.

**Result** The lap disks are removed.

### 10.3.1.4 Installing the Lap Disks

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The alignment shaft is necessary.
- ✓ The conical installation device is necessary.
- ✓ The shaft holder is necessary.
- ✓ The hook wrench is necessary.

**WARNING**

**Falling machine components!**

Dangerous injuries by crushing of body parts

- ▶ Do NOT lift heavy components manually.
- ▶ Always use a safe and applicable lifting device.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Install the lap disk cylinder.
4. Put the alignment shaft 5 from the outer side into the piston rod 4.

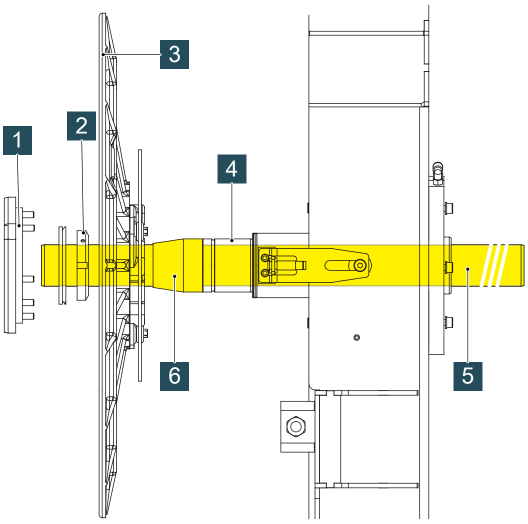

*Figure 345: Installation of the lap disk*

5. Push the conical installation device 6 onto the alignment shaft 5.
6. **WARNING! Falling components! Dangerous injuries by crushing of the person.** Push the lap disk 3 onto the alignment shaft 5.
7. Push the lap disk 3 onto the piston rod 4.
8. Pull out the alignment shaft 5.
9. Put the shaft holder into the piston rod 4.
10. Tighten the slotted nut 2 with the hook wrench.
11. Tighten the grub screw at the edge of the slotted nut 2.
12. Install the flange 1.
13. Install the bracket and the proximity switch.
14. Do the steps 3 to 13 again for the lap disk on the other side.

**Result** The lap disks are installed.

### 10.3.1.5 Removing the Lap Disk Cylinders

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the lap disk 1.

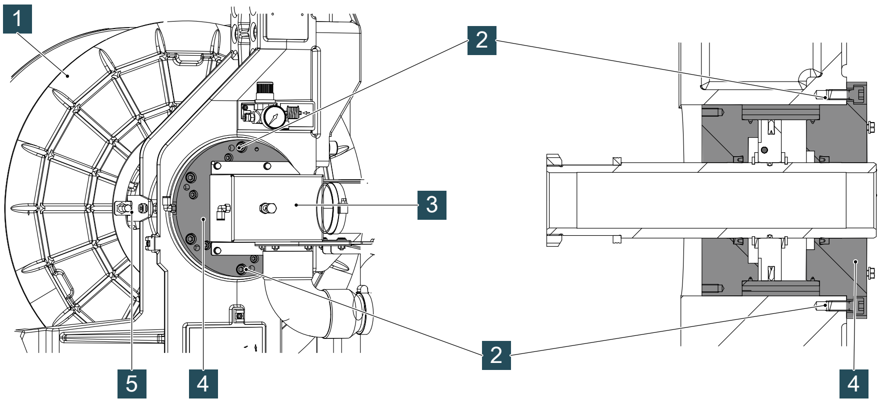

*Figure 346: The lap disk cylinders*

4. Remove the opener arm at the left side.
5. Remove the cover 3 for the tube suction at the right side.
6. Remove the bracket 5.
7. Disconnect the air pipes.
8. Remove the screws 2.
9. Pull out the lap disk cylinder 4.
10. Do the steps 3 to 9 again for the lap disk cylinder on the other side.

**Result** The lap disk cylinders are removed.

### 10.3.1.6 Installing the Lap Disk Cylinders

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Put the lap disk cylinder 4 against the frame.

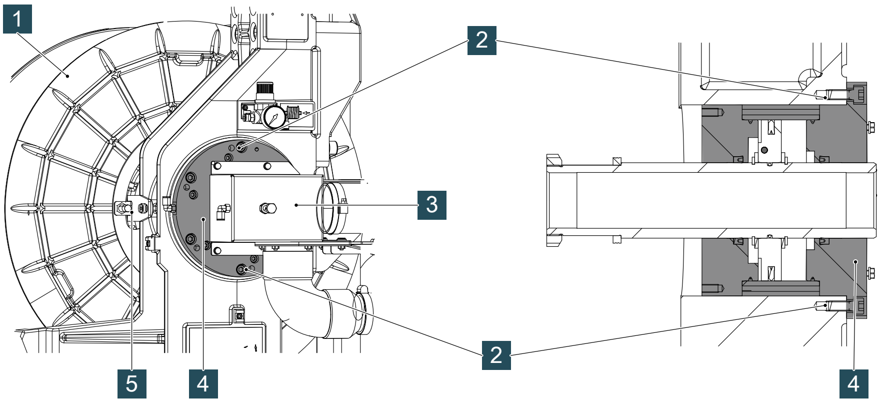

*Figure 347: The lap disk cylinders*

4. Tighten the screws 2.

5. Install the lap disk 1.
6. Connect the air pipes.
7. Install the bracket 5.
8. Set the cover 3 for the tube suction.
9. Do the steps 3 to 6 again for the lap disk cylinder on the other side.

**Result** The lap disk cylinders are installed.

### 10.3.1.7 Setting the Cover for the Tube Suction

The tube suction has to be set for the lap disks.

The cover 2 must close the hollow shaft 1 when the lap disks are open.

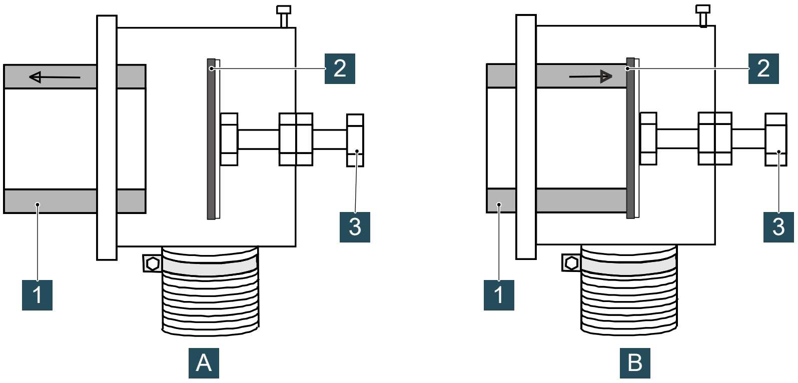

*Figure 348: Cover for the tube suction*

| Lap Disks Condition | Tube Suction Condition |
|---|---|
| A: Lap disks are closed. | Tube suction is started. |
| B: Lap disks are opened. | Tube suction is stopped. |

1. Use the screw 3 to adjust the cover 2.
2. Set the cover 2 until the tube suction is stopped when the lap disks are open.

**Result** The cover for the tube suction is set.

### 10.3.1.8 Disassembling the Lap Disk Cylinder

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the long screws 2.

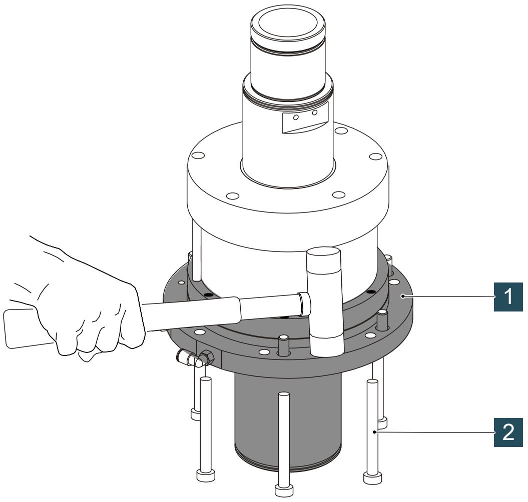

*Figure 349: Removal of the long screw*

4. Put the lap disk cylinder on an applicable support to hold the lap disk cylinder.
5. Hit the cylinder base 1 down along with the guide bushing with a plastic hammer.
6. Pull out the cylinder tube 3.

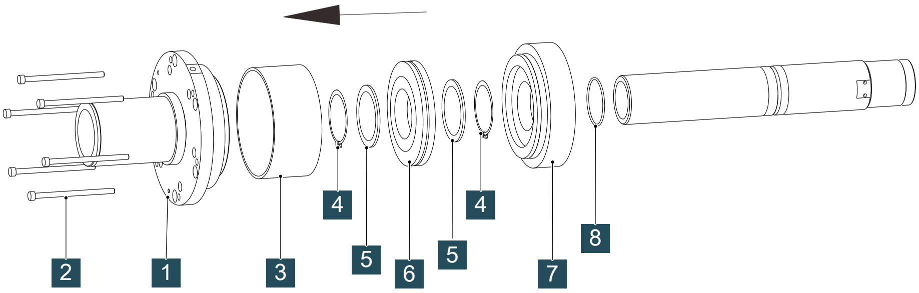

*Figure 350: Parts of the lap disk cylinder*

7. Remove the circlip 4.
8. Pull out the disk 5.
9. Pull out the piston plate 6.
10. Pull out the disk 5.
11. Remove the circlip 4.
12. Pull out the cylinder cover 7.
13. Pull out the sealing ring 8.

**Result** The lap disk cylinder is disassembled.

### 10.3.1.9 Assembling the Lap Disk Cylinder

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

- ✓ The safety block is necessary.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Lubricate the seals.
4. Put the seals in the cylinder base 1 and the cylinder cover 2. The sealing lips 11 have to be opened towards the pressure side.

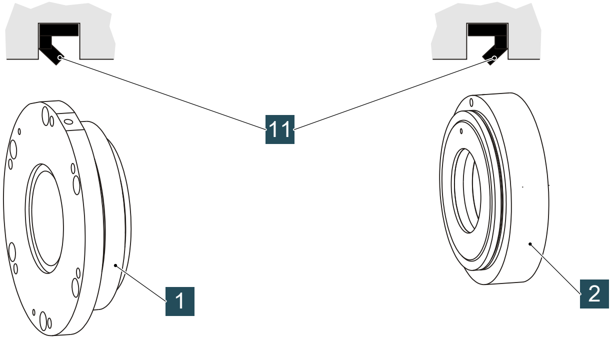

*Figure 351: Cylinder base and cylinder cover*

5. At the left side A, align the cylinder base 1 and the cylinder cover 2 until the angle X between the air connection points is 90°.

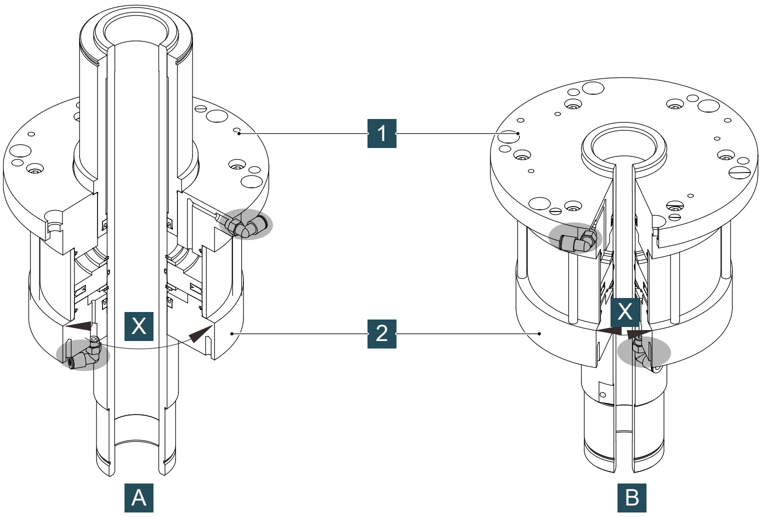

*Figure 352: Alignment of the cylinder base and the cylinder cover*

6. At the right side B, align the cylinder base 1 and the cylinder cover 2 until the angle X between the air connection points is 30°.
7. Clean and lubricate the piston rod 8.

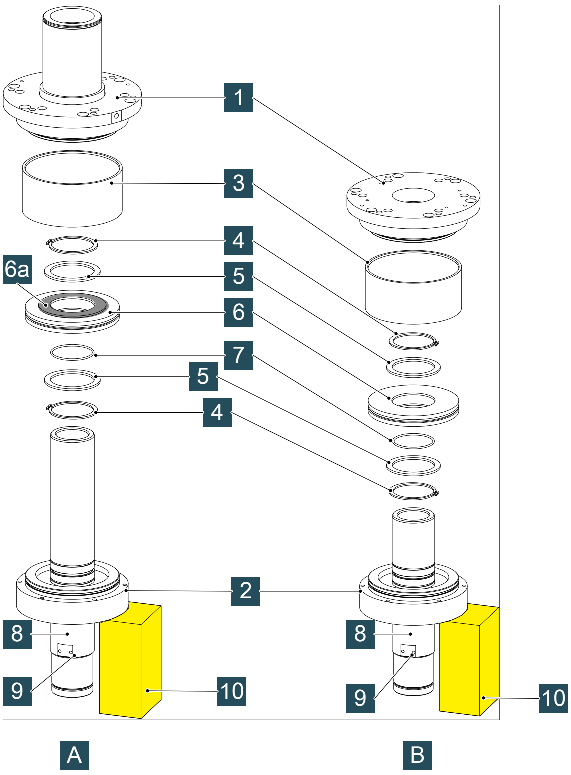

*Figure 353: Lap disk cylinder*

8. Put the piston rod to make sure that the edge 9 of the piston rod 8 is at the bottom.
9. Install the cylinder cover 2. (The cylinder cover must not be below the edge 9.)
10. Put the safety block 10 below the cylinder cover 2.
11. Install the circlip 4.
12. Install the disk 5.
13. Install the seal 7.
14. At the left side A, to install the piston plate 6, make sure that the collar 6a is up.
15. At the right side B, to install the piston plate 6, make sure that the collar is down.
16. Install the disk 5.
17. Install the circlip 4.
18. Install the cylinder tube 3.
19. Install the cylinder base 1.
20. Install the long screws.

**Result** The lap disk cylinder is assembled.

### 10.3.1.10 Removing the Ejector Pin

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ No tube is between the lap disks.

1. Select the **Service mode** in the data screen 80.1.
2. Close the lap disks in the data screen 82.1.
3. Set the main switch to the position OFF.
4. Padlock the main switch.
5. Hold the bolt 3 with an open-ended wrench.

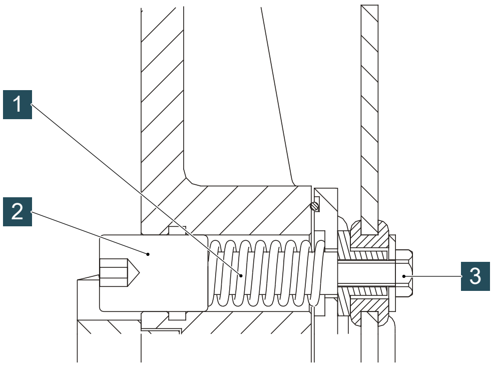

*Figure 354: Ejector pin*

6. Loosen the ejector pin 2 with a hexagonal key.
7. Pull out the spring 1 and the ejector pin 2 from the lap disk.

**Result** The ejector pin is removed.

### 10.3.1.11 Installing the Ejector Pins

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ No tube is between the lap disks.

1. Select the **Service mode** in the data screen 80.1.
2. Close the lap disks in the data screen 82.1.
3. Set the main switch to the position OFF.
4. Padlock the main switch.
5. Install the spring 1 and the ejector pin 2.

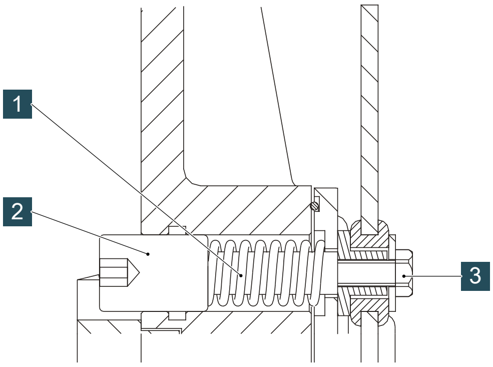

*Figure 355: Ejector pin*

6. Hold the ejector pin 2.
7. Tighten the bolt 3.
8. Make sure that all 3 ejector pins 2 are out as shown in the figure when there is no tube in the machine.

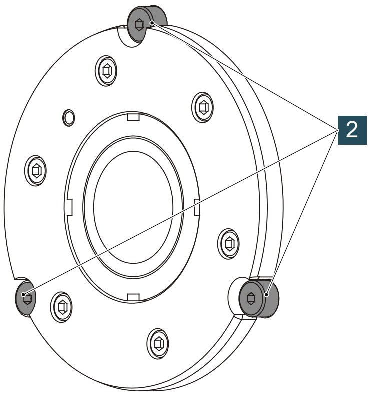

*Figure 356: Ejector pin examination*

9. If not all 3 ejector pins are out, replace the relevant ejector pins.

**Result** The ejector pins is installed.

### 10.3.1.12 Removing the Support for the Drive Roller

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.

## WARNING

**Moving machine components!**

Risk of hand injury

- Do NOT touch the machine components that move.
- Before setting the main switch to position OFF, make sure that the machine is at a standstill.
- When do maintenance work and repair work, set the main switch to the position OFF and padlock the main switch.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the axle support 1.

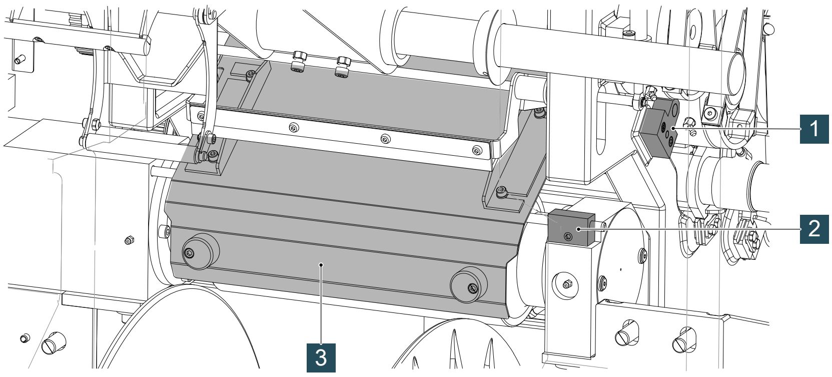

*Figure 357: Support for the drive roller*

4. Remove the fastening piece 2 and the support rod.
5. Pull out the delivery plate 3.
6. **WARNING! Moving machine components! Risk of hand injury because the machine components move.** Remove the 4 bolts 4.

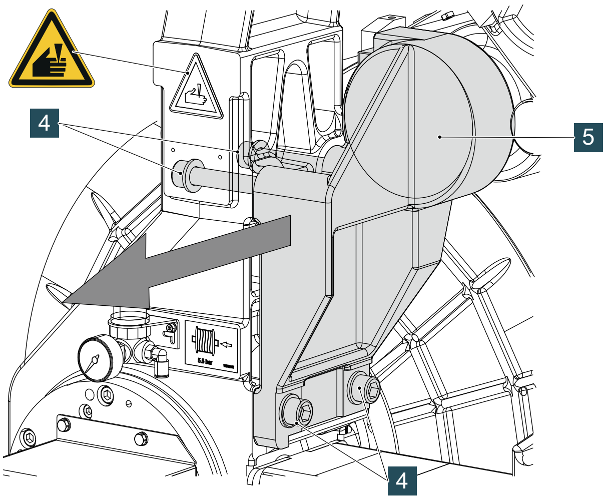

*Figure 358: Removal of the support*

7. Remove the support 5.

**Result** The support for the drive roller is removed.

### 10.3.1.13 Installing the Support for the Drive Roller

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.
- ✓ The setting gauge is necessary.
- ✓ The torque wrench (210 Nm) is necessary.

**WARNING**

**Moving machine components!**

Risk of hand injury

- ▶ Do NOT touch the machine components that move.
- ▶ Before setting the main switch to position OFF, make sure that the machine is at a standstill.
- ▶ When do maintenance work and repair work, set the main switch to the position OFF and padlock the main switch.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Put the setting gauge 2 in the correct position as shown in the figure.

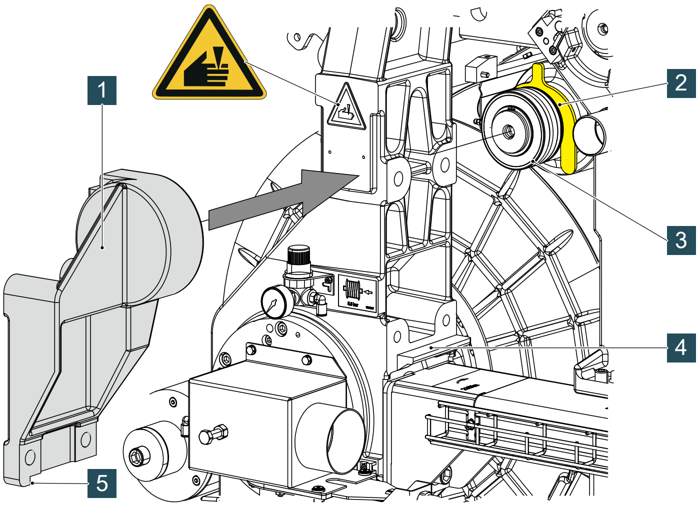

*Figure 359: Installation of the support for the drive roller*

4. Put the support 1 on the end stop 4.
5. Push the support 1 until the support is against the setting gauge 2.
6. If the support 1 is against the bearing 3 during the pushing procedure, move the setting gauge to and fro.
7. Remove the setting gauge 2.
8. Push the support 1 again until the pin 5 touches the side of the adjacent column.
9. Examine if the support 1 is against the end stop 4 along the length.
10. Tighten the bolt on the support 1 with the torque wrench. Torque: 210 Nm.
11. Install the support rod and the fastening piece.
12. Install the delivery plate.
13. Install the axle support.

**Result** The support for the drive roller is installed.

### 10.3.1.14 Removing the Lap Belt

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The lap is ejected from the lap disks.
- ✓ The support for the drive roller is removed (*refer to* ▸ *357*).
- ✓ The safety block (dimension: 150 × 150 × 170 mm) is necessary.
- ✓ The main switch is set to the position OFF and padlocked.

1. Put the safety block below the passive lever roller 4.

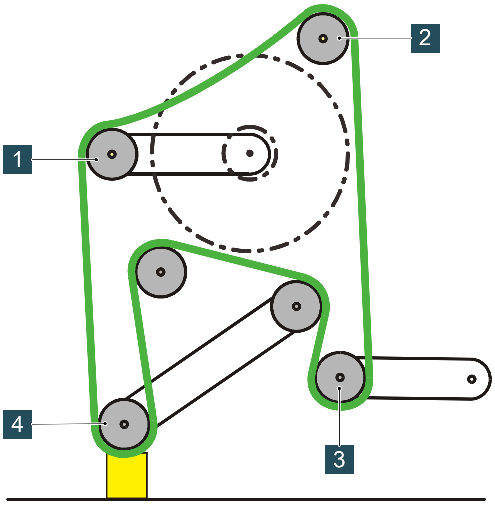

Figure 360: Lap belt_1

2. Unlock the main switch.
3. Set the main switch to the position ON.
4. Select the **Service mode** in the data screen 80.1.
5. Lift the tension lever roller 3 in the data screen 82.1.
6. Lift the opener arm roller 1 in the data screen 82.1 to the position that the opener arm roller is a small distance above the bottom edge of the front door.
7. Remove the lap belt at the passive arm roller 4.

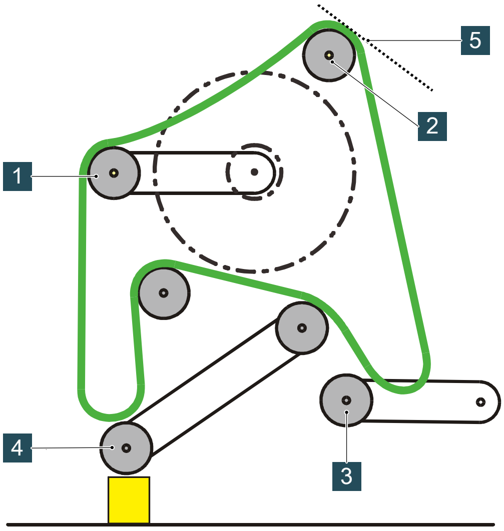

Figure 361: Lap belt_2

8. Remove the lap belt at the tension arm roller 3.
9. Pull the lap belt at an angle of 45° near 5.

   ⇨ The lap belt can easily be removed at this angle.

10. Pull the lap belt from the drive roller 2 into the position between the lap disk 6 and the column.

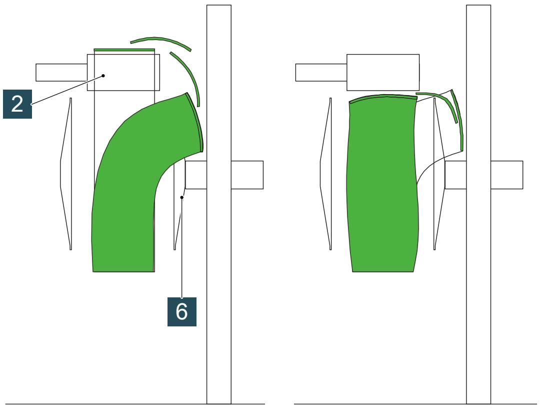

*Figure 362: Lap belt_3*

11. From this position, push the lap belt below the drive roller 2.
12. Make sure that the lap belt is loose.
13. Remove the lap belt from the opener arm roller 1.

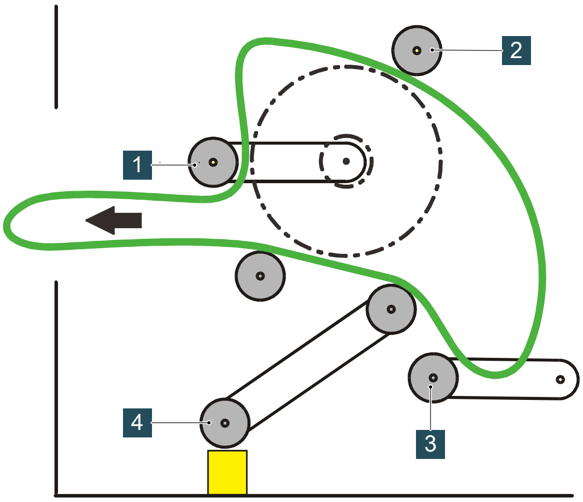

*Figure 363: Lap belt_4*

14. Carefully roll up the lap belt.
15. Pull the lap belt out of the machine.

**Result** The lap belt can easily be removed at this angle.

### 10.3.1.15 Installing the Lap Belt

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The lap is ejected from the lap disks.
- ✓ The support for the drive roller is removed (*refer to ▸ 357*).
- ✓ The safety block (dimension: 150 × 150 × 170 mm) is necessary.

1. Put the safety block below the passive arm roller 4.

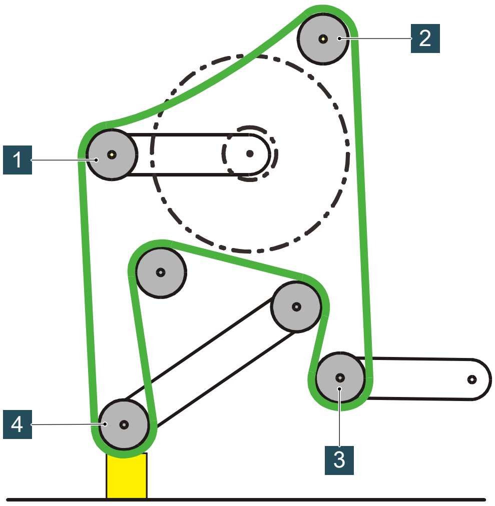

*Figure 364: Lap belt_1*

2. Select the **Service mode** in the data screen 80.1.
3. Lift the tension arm roller 3 in the data screen 82.1.
4. Lift the opener arm roller 1 in the data screen 82.1 to the position that the opener arm roller is a small distance above the bottom edge of the front door.
5. Put the lap belt to the machine through the front door.
6. Install the lap belt at the opener arm roller 1.
7. Install the lap belt at the drive roller 2.
8. Install the lap belt at the tension arm roller 3.
9. Pull the lap belt from the tension arm roller 3 to the passive arm roller 4.
10. Install the belt at the passive arm roller 4.

**Result** The lap belt is installed.

### 10.3.1.16 Removing the Opener Arm

**WARNING**

**Falling machine components!**

Dangerous injuries by crushing of body parts

- ▶ Do NOT lift heavy components manually.
- ▶ Always use a safe and applicable lifting device.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.

2. Padlock the main switch.
3. Remove the opener arm roller.
4. Identify the position of the cover 1 with a mark.

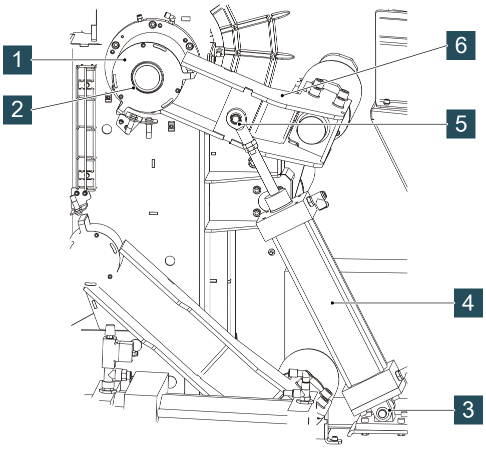

*Figure 365: Removal of the opener arm*

⇨ The repair personnel can install the lid at the same position identified with the mark.

5. Remove the cover 1.
6. Move the opener arm 6 to a horizontal position.
7. Support the opener arm 6 with a wooden batten.
8. Remove the bolt 3.

⇨ The cylinder can be moved.

9. Remove the locking ring of the fork head 5.
10. Move the cylinder in a small distance to make sure that the fork head 5 is possible to be moved.
11. Remove the fork head 5.
12. Install the bolt 3.
13. Turn the pneumatic cylinder 4 away from the opener arm 6.
14. Remove the locking ring 2.
15. **WARNING! Falling components! Dangerous injuries by crushing of the person.** Remove the opener arm 6.

**Result** The opener arm is removed.

### 10.3.1.17 Installing the Opener Arm

## WARNING

**Falling machine components!**

Dangerous injuries by crushing of body parts

- ▶ Do NOT lift heavy components manually.
- ▶ Always use a safe and applicable lifting device.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. **WARNING! Falling components! Dangerous injuries by crushing of the person.** Install the opener arm 6.
4. Install the locking ring 2.

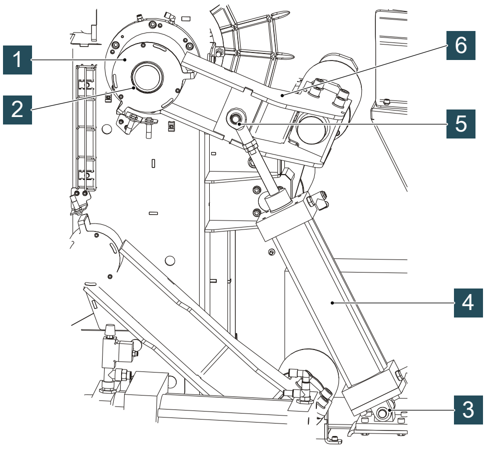

*Figure 366: Removal of the opener arm*

5. Turn the pneumatic cylinder 4 back to the opener arm 6.
6. Install the fork head 5.
7. Tighten the bolt 3.
8. Install the locking ring of the fork head 5.
9. Install the cover 1.

**Result** The opener arm is installed.

### 10.3.1.18 Removing the Opener Arm Roller

## WARNING

**Falling machine components!**

Dangerous injuries by crushing of body parts

- ▶ Do NOT lift heavy components manually.
- ▶ Always use a safe and applicable lifting device.

1. Push the stop button during a lap change.

   ⇨ The lap is ejected and the new tube is not put in.
2. Select the **Service mode** in the data screen 80.1.
3. Move the opener arm to a horizontal position in the data screen 82.1.
4. Support the opener arm roller with a wooden batten.
5. Set the main switch to the position OFF.
6. Padlock the main switch.
7. Identify the distance X on the shaft with a mark.

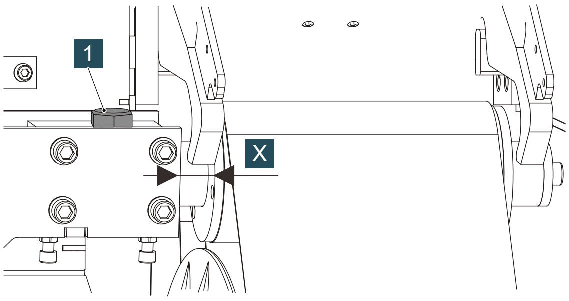

*Figure 367: Opener arm roller*

   ⇨ The repair personnel can install the roller at the same position identified with the mark.
8. Loosen the bolt 1.
9. **WARNING! Falling components! Dangerous injuries by crushing of the person.** Remove the roller at the right side.

**Result** The opener arm roller is removed.

## 10.3.1.19 Installing the Opener Arm Roller

**WARNING**

**Falling machine components!**

Dangerous injuries by crushing of body parts

- ▶ Do NOT lift heavy components manually.
- ▶ Always use a safe and applicable lifting device.

1. Push the stop button during a lap change.
   ⇨ The lap is ejected and the new tube is not put in.
2. Select the **Service mode** in the data screen 80.1.
3. Move the opener arm to a horizontal position in the data screen 82.1.
4. Set the main switch to the position OFF.
5. Padlock the main switch.
6. **WARNING! Falling components! Dangerous injuries by crushing of the person.** Install the roller at the right side.
7. Tighten the bolt 1.

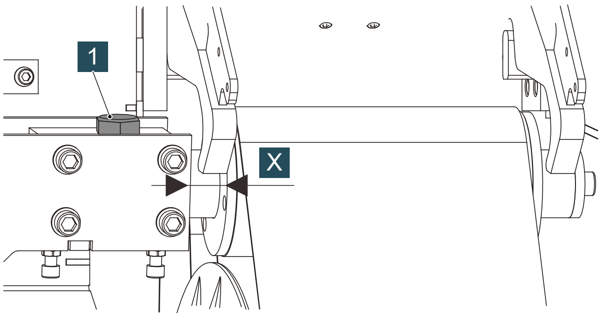

*Figure 368: Opener arm roller*

**Result** The opener arm roller is installed.

## 10.3.1.20 Replacing the Motor for the Belt Control Mechanism

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the screws 1.

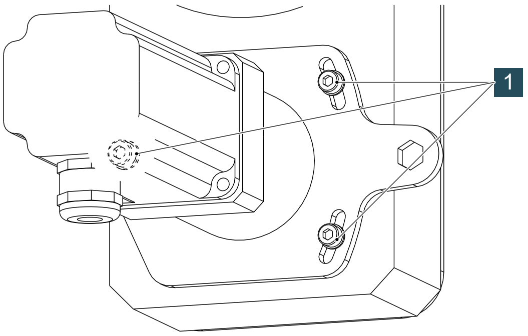

*Figure 369: The motor for the belt control mechanism*

4. Pull out the motor.
5. Replace the motor with a new motor.
6. Install the screws 1.

**Result** The motor for the belt control mechanism is replaced.

### 10.3.1.21 Replacing the Toothed Belt

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the motor for the belt control mechanism.
4. Remove the cover plate.
   ⇨ The repair personnel have access to the toothed belt 1.

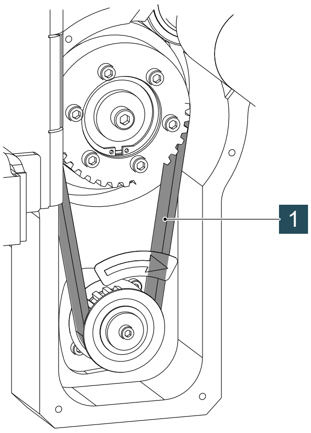

*Figure 370: Toothed belt*

5. Remove the toothed belt 1.
6. Put the new toothed belt.
7. Install the motor for the belt control mechanism.

8. Tighten the toothed belt (*refer to ▸ 369*).

**Result** The toothed belt is replaced.

### 10.3.1.22 Tightening the Toothed Belt

**WARNING**

**Moving parts!**

Dangerous injuries because of the moving parts when you do the function test.

- ▶ Do **NOT** stay near the moving parts.
- ▶ Only the approved personnel are permitted to do the function test in the service mode.

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Loosen the screw 1.

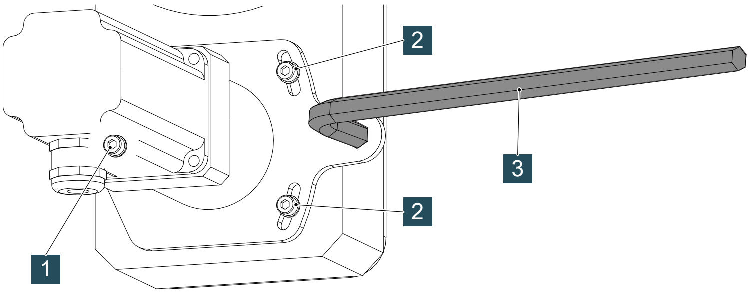

*Figure 371: The procedure for tightening the toothed belt*

4. Loosen the screws 2.
5. Move the motor with the hexagonal key 3 until the toothed belt is tight.
6. Tighten the screws 2.
7. Tighten the screw 1.
8. Move the shaft in the direction of the arrow 5 until the pulley 4 turns 1 revolution.

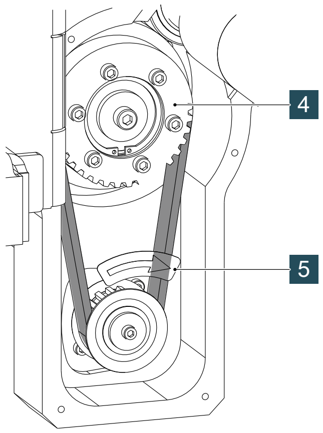

*Figure 372: Toothed belt*

⇨ The drive moves easily and the toothed belt has correct tension.

9. Go to the data screen 82.1.
10. **WARNING! Moving parts! Dangerous injuries because of the mechanical movements of the parts when you do the function test.** Select the function **Step motor**.
11. Examine if the drive turns 1 revolution.
12. Examine if the drive stops at the position 0.

⇨ The LED indicator at the proximity switch is on.

**Result** The toothed belt is tightened.

### 10.3.2 Longitudinal Section

This section contains the information about the repair work of the longitudinal section.

#### 10.3.2.1 Replacing the Top Roller Wipers

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the wipers 1 with a hand.

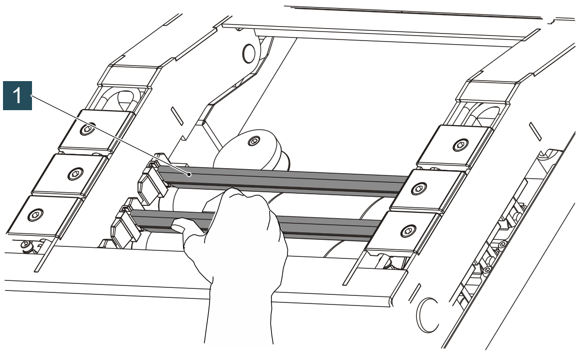

Figure 373: Wipers of the drafting system

4. Put the new wipers on the 2 sides on the guides.
5. Push the wipers.
   ⇨ The full length of the sealing lip is on the top rollers.

**Result** The top roller wipers are replaced.

### 10.3.2.2 Replacing the Top Roller

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Lift the top roller 1 with a hand.

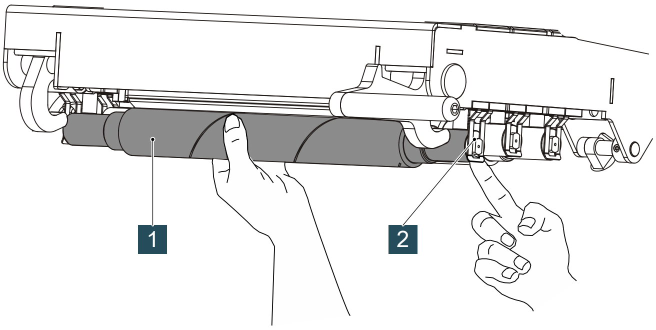

Figure 374: Top rollers

4. Turn out the spring latch 2 with a hand.
5. Remove the top roller.
6. Put the new top roller in the correct position.
7. Connect the top roller to the spring latch 2 at the position A.

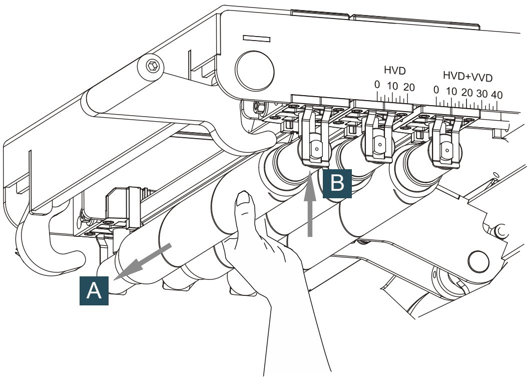

*Figure 375: Installation of the top roller*

8. Push the top roller at the position B.

   ⇨ The spring latch 2 locks into position.

**Result** The top roller is replaced.

### 10.3.2.3 Replacing the Bottom Roller Wipers

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Open the flap 2.

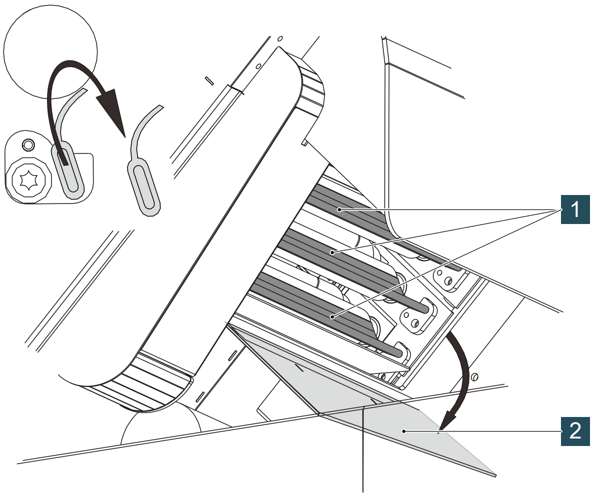

*Figure 376: Bottom roller wipers*

4. Lift the wipers 1.
5. Remove the wipers 1 from the holding device.
6. Put the new wipers from above into the holding device.
7. Examine the sealing lips for the correct position.

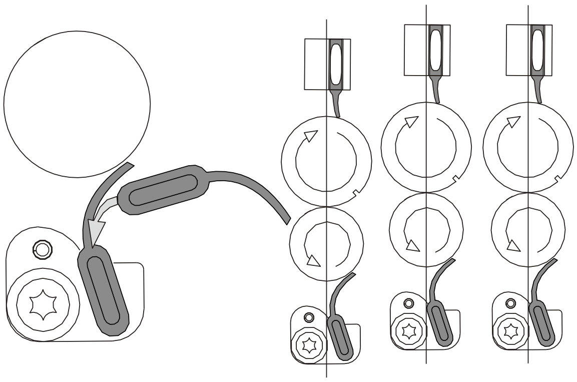

*Figure 377: The correct position of the bottom roller wipers*

**Result** The bottom roller wipers are replaced.

### 10.3.2.4 Removing the Belts for the Feed Bottom Roller

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

**WARNING**

**Moving belts**

Drive belts without covers cause injury to the hands.

▶ Do **NOT** touch the moving belts.

▶ Do adjustment only when the machine is at a standstill.

1. Turn the belt tensioner 1 to the right side.

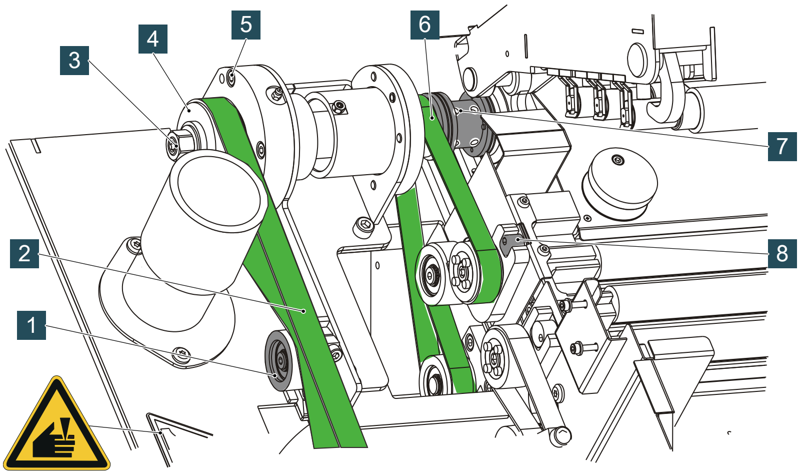

*Figure 378: Belt for the feed bottom roller*

⇨ The belt 2 is loose.

2. Remove the belt 2.

3. Turn the eccentric 8 with a hexagonal key.

   ⇨ The belt 6 is loose.

4. Loosen all 4 bolts 5.
5. Loosen the 2 front clamping screws 7.
6. Pull out the shaft 3 at the position of the pulley 4.
7. Remove the belt 6.

**Result** The belts for the feed bottom roller are removed.

### 10.3.2.5 Installing the Belts for the Feed Bottom Roller

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

## WARNING

**Moving belts**

Drive belts without covers cause injury to the hands.

▶ Do **NOT** touch the moving belts.

▶ Do adjustment only when the machine is at a standstill.

1. Put the belt 6 at the correct position.

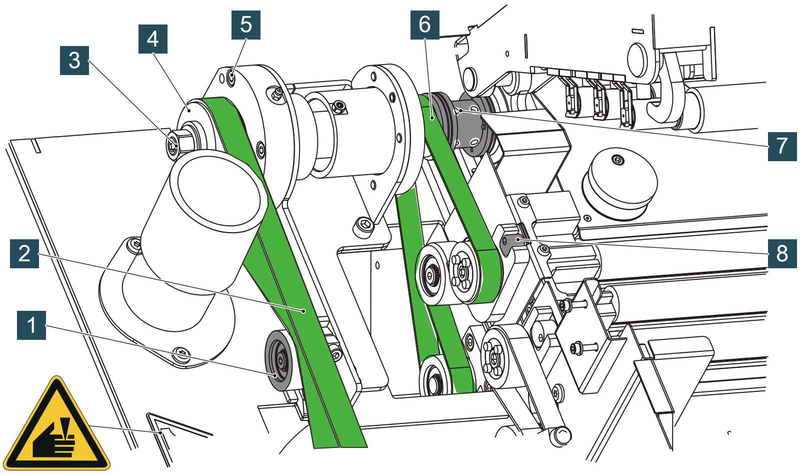

*Figure 379: Belt for the feed bottom roller*

2. Push the shaft 3 at the position of the pulley 4.
3. Tighten the 2 front clamping screws 7.
4. Tighten all 4 bolts 5.
5. Turn the eccentric 8 with a hexagonal key.

   ⇨ The belt 6 is tight.

6. Install the belt 2.

7. Move the belt tensioner 1 to the left side.
   ⇨ The belt 2 is tight.
8. Set the belt to the center position at the pulley.

**Result** The belts for the feed bottom roller are installed.

### 10.3.2.6 Removing the Flexible Coupling

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The main switch is set to the position OFF and padlocked.
- ✓ The belts for the feed bottom roller are removed (*refer to ▸ 373*).

1. Remove the screw 2.

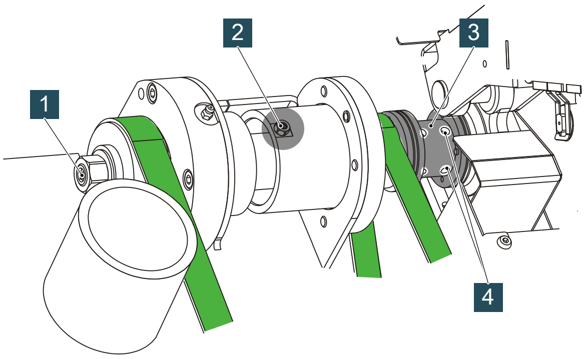

*Figure 380: Flexible coupling*

2. Pull out the shaft 1.
3. Loosen the 2 rear clamping screws 4.
4. Remove the flexible coupling 3.

**Result** The flexible coupling is removed.

### 10.3.2.7 Installing the Flexible Coupling

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.

1. Put the flexible coupling 3 at the correct position.

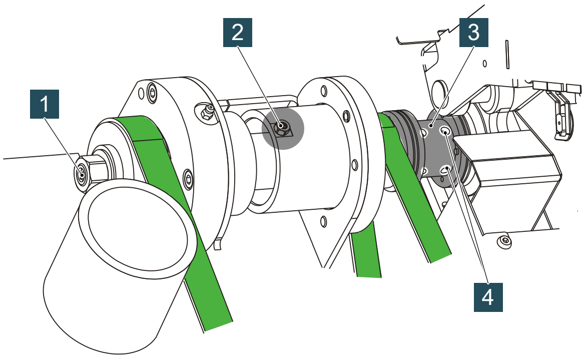

*Figure 381: Flexible coupling*

2. Tighten the 2 rear clamping screws 4.
3. Push in the shaft 1.
4. Install the stop screw 2.

**Result** The flexible coupling is installed.

### 10.3.2.8 Removing the Loading Elements

**Prerequisites** Make sure that the criteria are obeyed:

✓ The main switch is set to the position OFF and padlocked.

1. Remove the top roller wipers.
2. Remove the top rollers.
3. Remove the bolts 2 on the loading elements 1 that is necessary to remove.

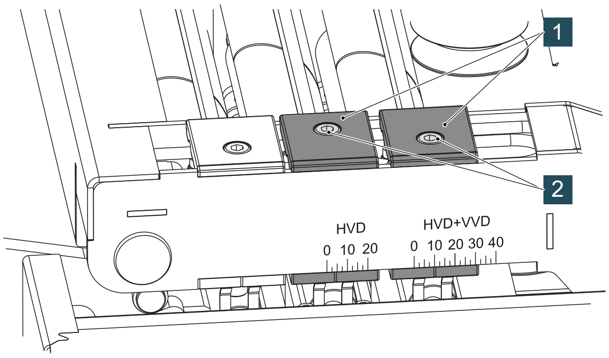

*Figure 382: Loading elements*

4. Disconnect the compressed-air supply from the loading elements 1.
5. Remove the 2 nuts 5.

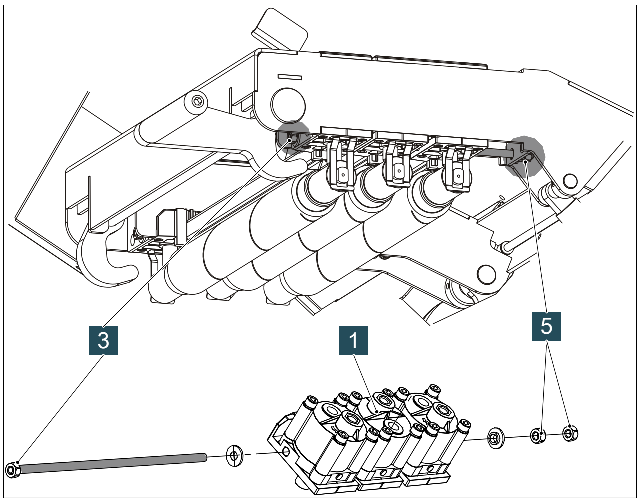

*Figure 383: Removal of the loading elements*

6. Pull out the clamping bolt 3 until the loading elements are possible to be removed.

7. Remove the loading elements 1.

**Result** The loading elements are removed.

### 10.3.2.9 Installing the Loading Elements

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Push the clamping bolt 3 through the loading elements 1.

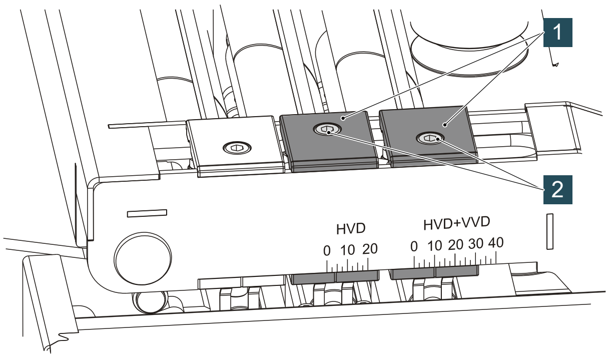

*Figure 384: Loading elements*

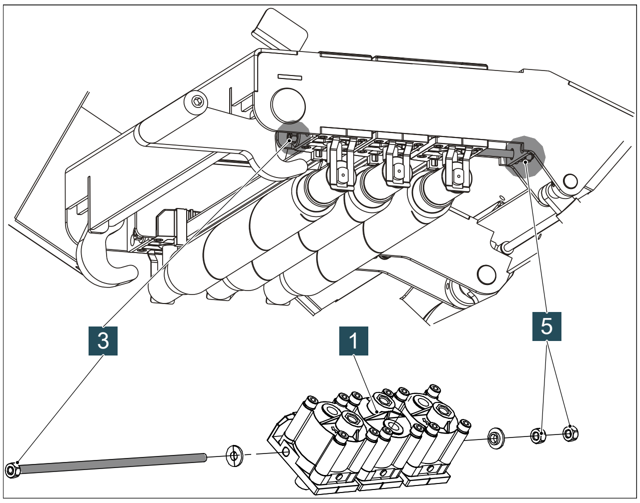

*Figure 385: Installation of the loading elements*

2. Install the 2 nuts 5.
3. Connect the compressed-air supply to the loading elements 1.
4. Install the bolts 2 on the loading elements 1.
5. Install the top rollers.
6. Install the top roller wipers.
7. Make sure that the spring latches 7 and the wiper guide 6 are put in the correct position. (The delivery top roller has longer spring latches.)

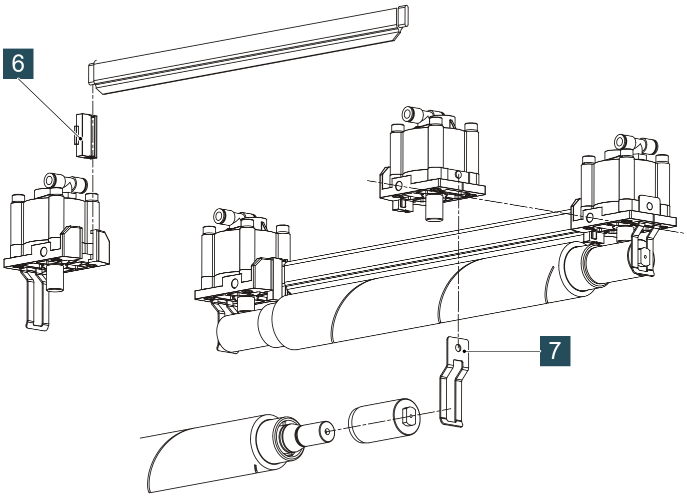

Figure 386: Spring latch and wiper guide

**Result** The loading elements are installed.

### 10.3.2.10 Replacing the Seal for the Loading Element

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Remove the bolts 1.

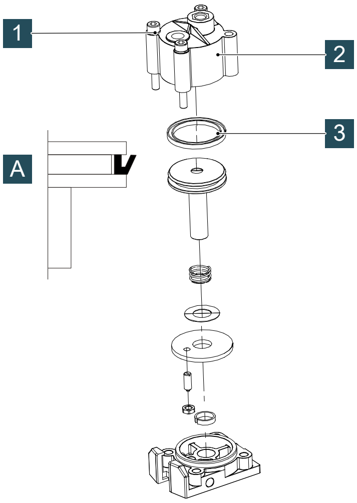

Figure 387: Seals for loading elements

2. Remove the cylinder head 2.
3. Replace the seal 3 with a new seal.
4. Make sure that the position of the seal is correct (refer to A).
5. Install the cylinder head 2 in the correct position.
6. Install the bolts 1.

**Result** The seal for the loading element is replaced.

### 10.3.2.11 Removing the Universal Shaft from the Table Calender

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the cover that hides the universal shaft.
4. Remove the cover 3.
5. Remove the clip 1.

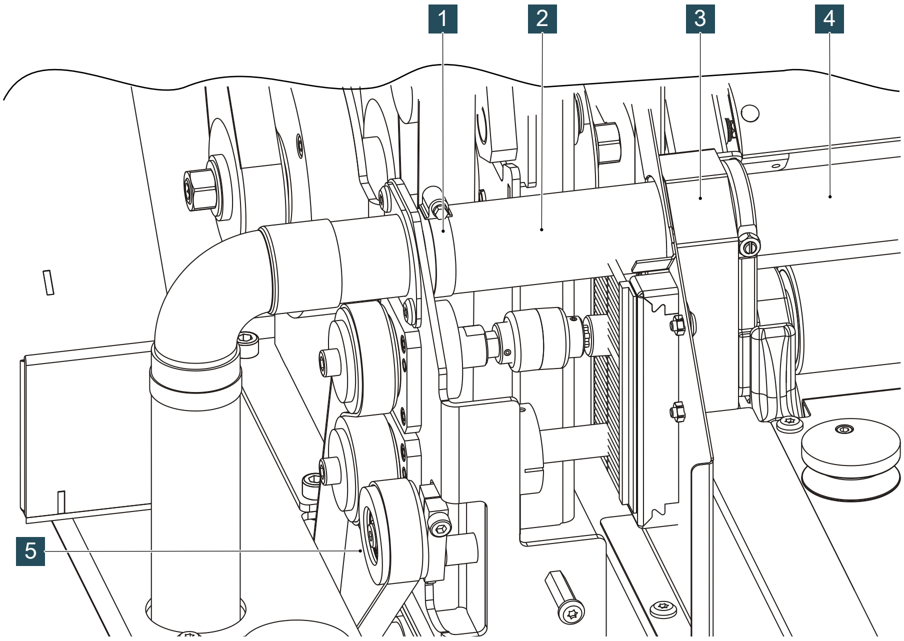

*Figure 388: Suction pipes of the table calender*

6. Remove the pipe 2.
7. Remove the pipe 4.
8. Turn the belt tensioner 5 clockwise to loosen the belt.
9. Hold the part 6 at the flat position with an open-ended wrench.

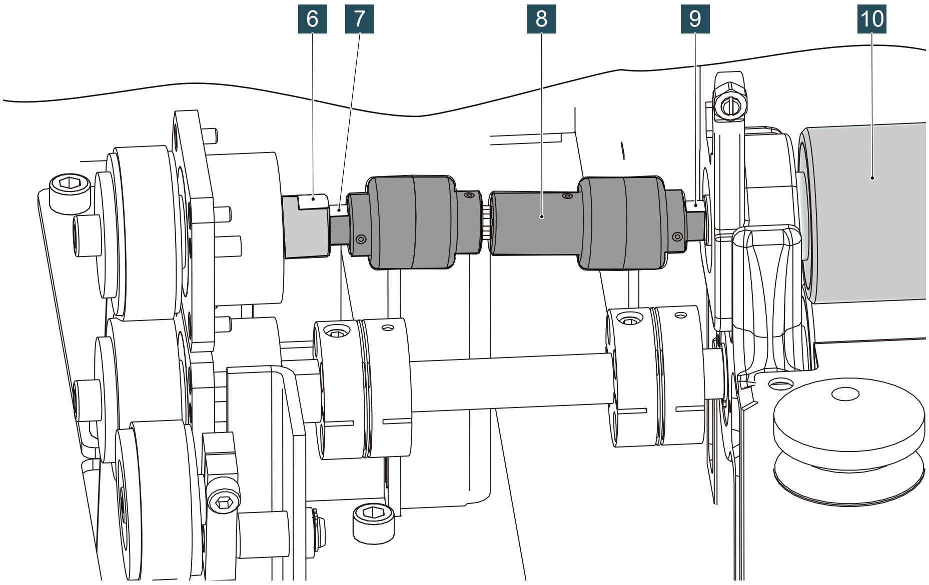

*Figure 389: Universal shaft of the table calender*

10. To turn the universal shaft 8 in the direction of the web that goes in the table calender, hold the part 7 at the flat position with an open-ended wrench.
    - ⇨ The left side of the universal shaft 8 is loosened.
11. Hold the universal shaft 8 at the flat position 9 with an open-ended wrench.
12. Turn the top calender cylinder 10 in the counter direction of the web that goes in the table calender.
    - ⇨ The right side of the universal shaft 8 is loosened.
13. Lift the top calender cylinder 10 with a small distance to remove the universal shaft 8.
14. Unlock the main switch.
15. Set the main switch to the position ON.

**Result** The universal shaft is removed from the table calender.

### 10.3.2.12 Installing the Universal Shaft to the Table Calender

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The universal shaft is removed.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Connect the universal shaft 8 to the top calender cylinder 10.

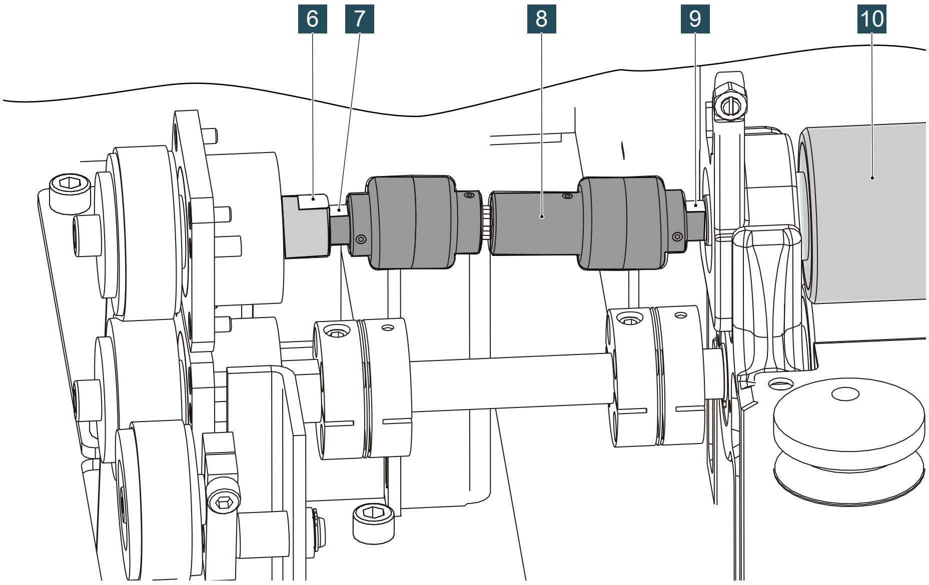

*Figure 390: Universal shaft of the table calender*

4. Hold the universal shaft 8 at the flat position 9 with an open-ended wrench.
5. Turn the top calender cylinder 10 in the direction of the web that goes in the table calender.

   ⇨ The right side of the universal shaft 8 is installed.
6. Hold the part 6 at the flat position with an open-ended wrench.
7. To turn the universal shaft 8 in the counter direction of the web that goes in the table calender, hold the part 7 at the flat position with an open-ended wrench.

   ⇨ The left side of the universal shaft 8 is installed.
8. Turn the belt tensioner 5 counterclockwise to tighten the belt.

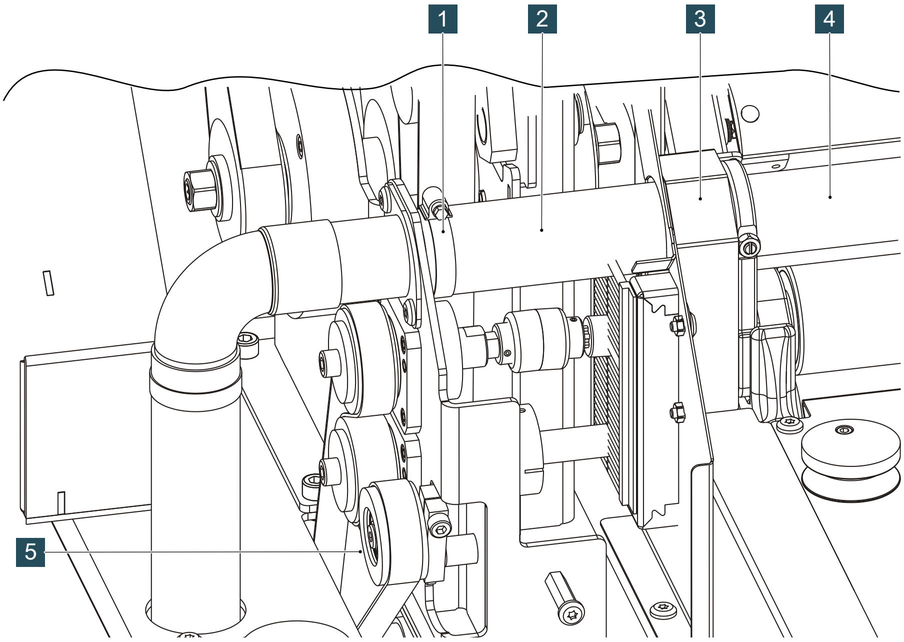

*Figure 391: Suction pipe of the table calender*

9. Install the pipe 4.
10. Install the pipe 2.
11. Install the clip 1.
12. Install the cover 3.
13. Install the cover that hides the universal shaft 8.
14. Unlock the main switch.
15. Set the main switch to the position ON.

**Result** The universal shaft is installed to the table calender.

### 10.3.2.13 Removing the Couplings from the Table Calender

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove the cover that hides the couplings 7.

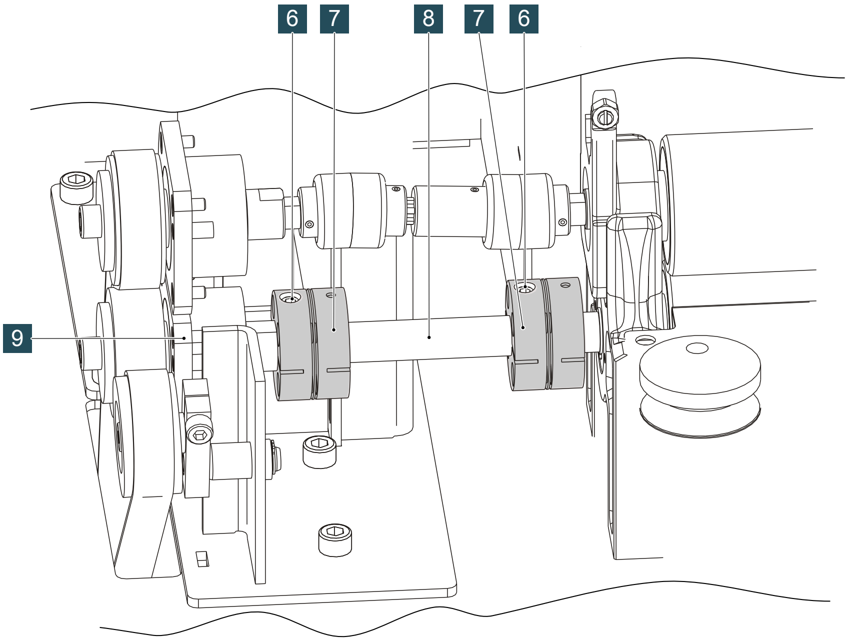

*Figure 392: Couplings of the table calender*

4. Remove the cover 3.

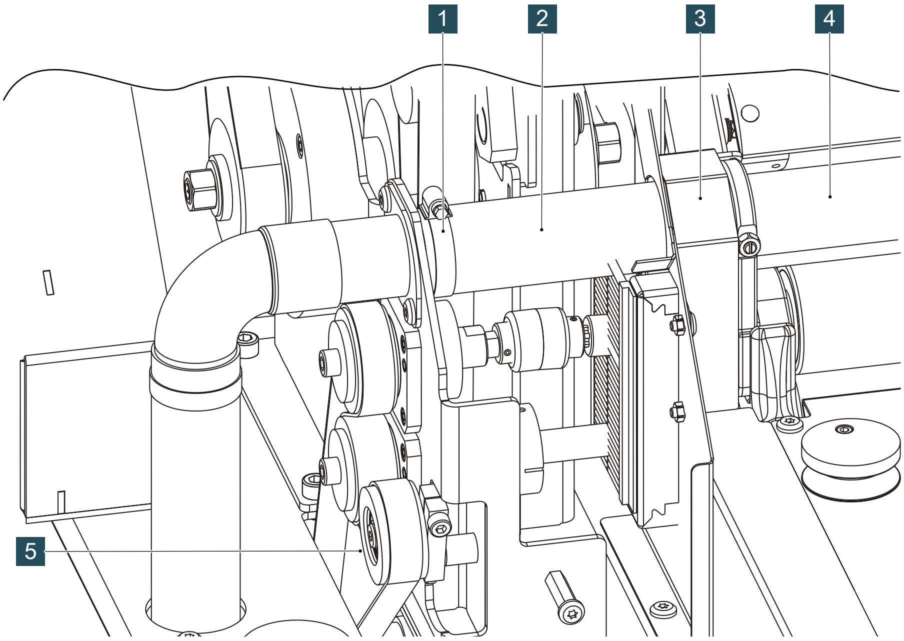

*Figure 393: Suction pipe of the table calender*

5. Remove the clip 1.
6. Remove the pipe 2.
7. Remove the 2 screws 6.
8. Remove the 4 bolts at the bearing block 9.

9. Remove the bearing block 9.
10. Remove the coupling 7 on the left side.
11. Remove the shaft 8.
12. Remove the coupling 7 on the right side.
13. Unlock the main switch.
14. Set the main switch to the position ON.

**Result** The couplings from the table calender are removed.

### 10.3.2.14 Installing the Couplings to the Table Calender

**Prerequisites** Make sure that the criteria are obeyed:

✓ The couplings from the table calender are removed.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Install the coupling 7 to the shaft 8 on the right side which is connected with the table calender.

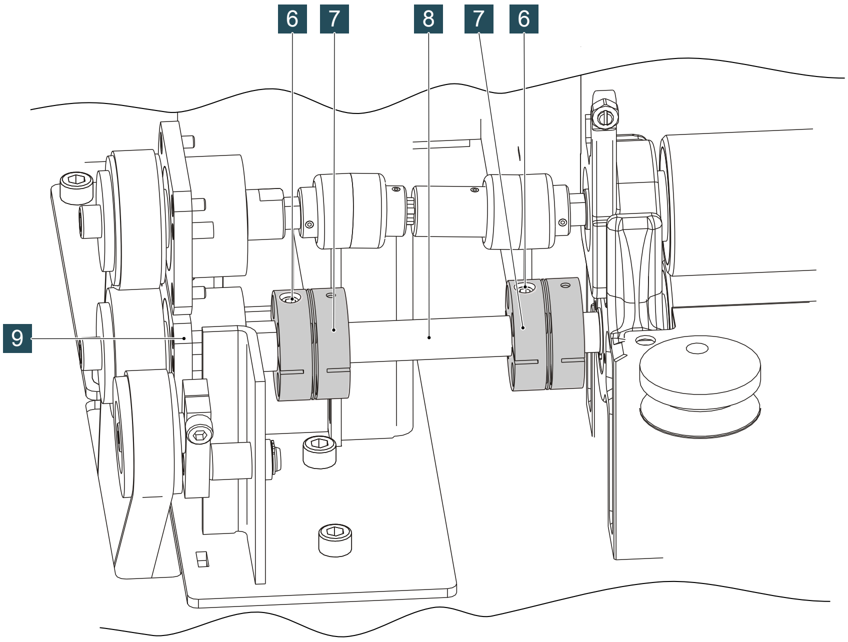

*Figure 394: Couplings for the table calender*

4. Install the shaft 8 to the machine.
5. Install the coupling 7 to the shaft 8 on the left side.
6. Install the bearing block 9 with the 4 bolts.
7. Install the 2 screws 6.
8. Install the pipe 2.

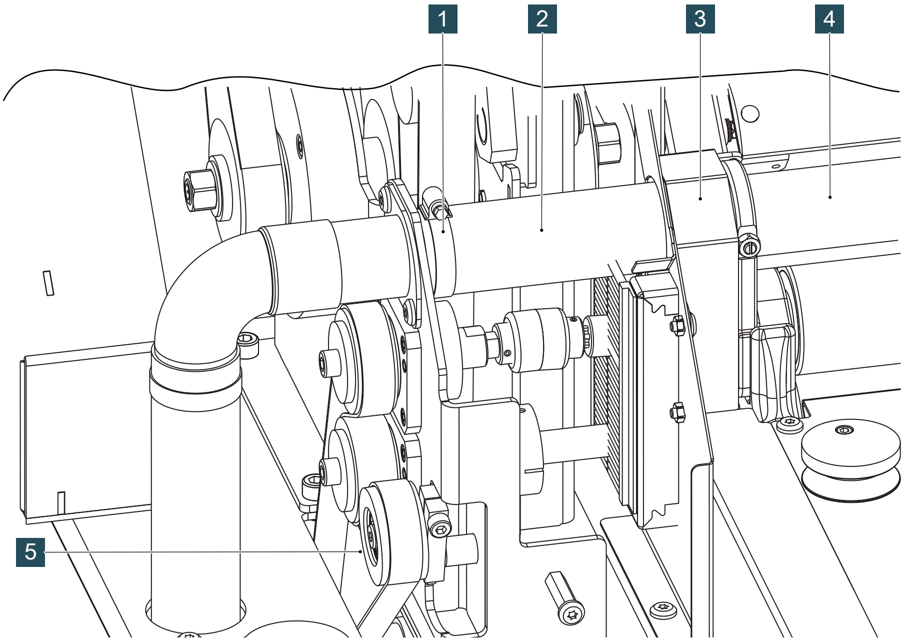

*Figure 395: Suction pipe of the table calender*

9. Install the clip 1.
10. Install the cover 3.
11. Install the cover at the couplings 7.
12. Unlock the main switch.
13. Set the main switch to the position ON.

**Result** The couplings are installed to the table calender.

### 10.3.3 Electronic Devices

This section contains the information about the repair work of the electronic devices.

#### 10.3.3.1 Replacing the CompactFlash Card in the Control System

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Push the ejection button with the end of a pencil or a blunt object 1.

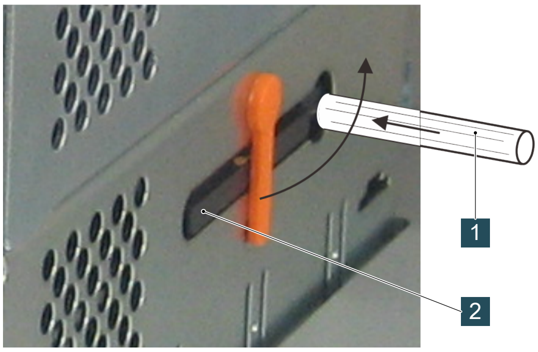

*Figure 396: CompactFlash card*

⇨ The CompactFlash card 2 is ejected.

4. Put the new CompactFlash card 2 into the operating unit slot.
5. Unlock the main switch.
6. Set the main switch to the position ON.

⇨ A cold start is done automatically.

**Result** The CompactFlash card in the control system is replaced.

### 10.3.3.2 Replacing the Frequency Converter

Replacing the frequency converter is done by the plant electricians.

## DANGER

**Remaining electricity in the frequency converter!**

Death or dangerous burn injury through the electric shock

- ▶ Set the main switch to the position OFF. Padlock the main switch.
- ▶ Do **NOT** touch the device that has remaining electricity until the LED for the charge display is off.
- ▶ Wait for 10 min until the frequency converter voltage becomes 0 V.
- ▶ Do **NOT** touch the device during the discharge time.

## Removing the Frequency Converter

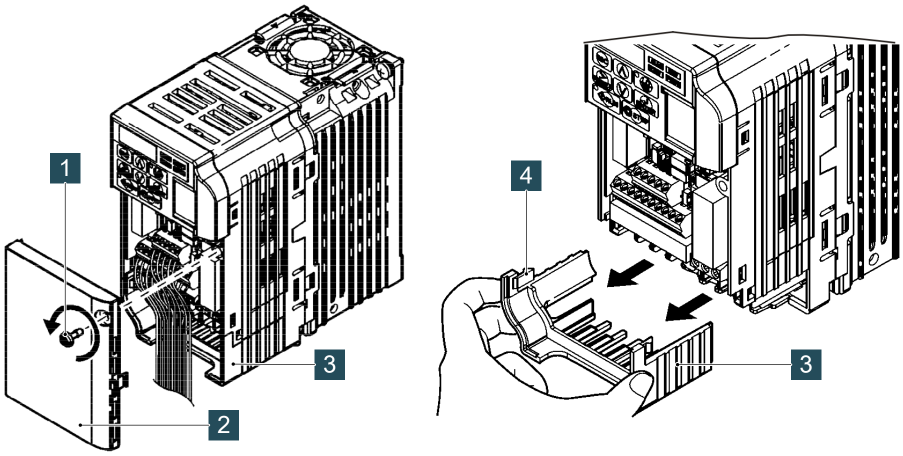

*Figure 397: Removal of the cover from the power unit*

1. The housing to be removed can deviate from the depicted housing.
2. Loosen the screw 1 and remove the cover 2.
3. Press the latches 4 of the cover 3 together.
4. Move the cover 3 in the direction of the arrow.

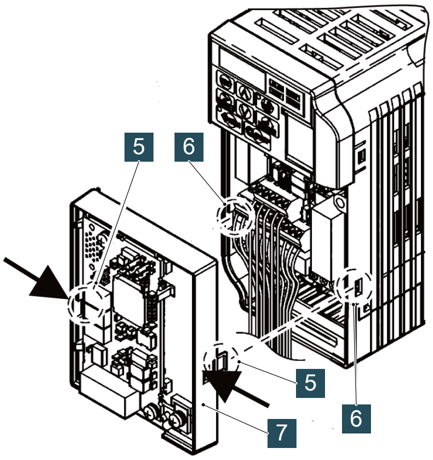

*Figure 398: Frequency converter*

5. Gently press together the latches 5 on the module 7.

   ⇨ The latches 5 disengage from the openings 6.
6. Remove the module 7.
7. Examine if the LED 8 is on.

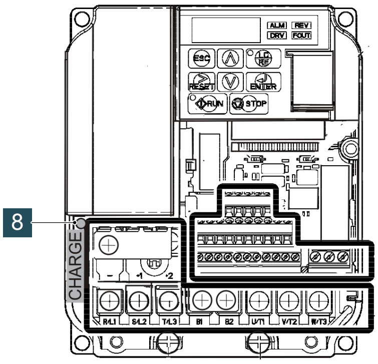

*Figure 399: LED at the frequency converter*

8. Check whether (CHARGE) LED lights up.
9. The LED will light up if the voltage for the intermediate circuit still exceeds 50 VDC.
10. Wait until the LED (CHARGE) has gone out.
11. After the LED (CHARGE) has gone out, wait 5 more minutes.
12. Measure the residual voltage between the terminals with the designations (-) and (+1) (intermediate circuit). Depending on, the terminals are arranged at different places of the power terminals.
13. If the residual voltage in the intermediate circuit has dropped below 30 VDC, disconnect the cables.

## Disconnecting Cable

1. Check the labelling of terminals and cables. Ensure that the cables can be properly connected during reinstallation.
2. Disconnect the power and control terminals.
3. Disconnect the earth cable from the earth terminal.
4. Do not pull the cables out of the cable bushings. The cable glands remain in the electrical control cabinet of the machine when the frequency converter is replaced.
5. Loosen the four fastening screws. Remove the frequency converter.

## Installing the Frequency Converter

1. Push the detent pawls 5 on the 2 sides of the module 7.

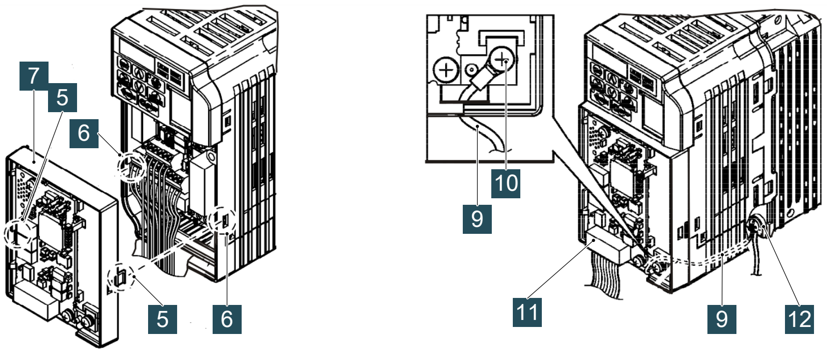

*Figure 400: Frequency converter*

2. Push the module 7 until the pawls 5 lock into position in the notch 6.
3. Connect the ground cable 9 to the ground terminal 10 of the CAN module.
4. Connect the other end of ground cable 9 to the ground terminal 12 of the frequency converter.
5. Keep the ground cable 9 from the CAN module to the frequency converter as short as possible.
6. Put the connector 11 of the CAN bus cable.
7. Install the cover 2.

   ⇨ The frequency converter is installed.

**Result** The frequency converter is replaced.

### 10.3.3.3 Setting the Frequency Converter

**Prerequisites** Make sure that the criteria are obeyed:

✓ The main switch is set to the position OFF and the main switch is padlocked.

## DANGER

**Remaining electricity in the frequency converter!**

Death or dangerous burn injury through the electric shock

▶ Set the main switch to the position OFF. Padlock the main switch.

▶ Do **NOT** touch the device that has remaining electricity until the LED for the charge display is off.

▶ Wait for 10 min until the frequency converter voltage becomes 0 V.

▶ Do **NOT** touch the device during the discharge time.

1. Set the switch S1 to the position V.

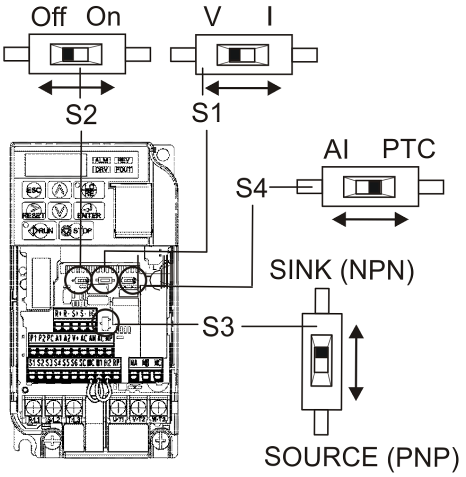

*Figure 401: DIP switches of the frequency converter*

2. Set the switch S2 to the position OFF.
3. Set the switch S3 to the position SOURCE (PNP).
4. Set the switch S4 to the position PTC.

**Result** The frequency converter is set.

### 10.3.3.4 Installing the Cooling System to the Frequency Converter

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The main switch is set to the position OFF and the main switch is padlocked.
- ✓ The frequency converter is removed.
- ✓ The spatula is to be used.

1. To remove the heat transfer compound that is on the heat transfer plates, use a spatula.
2. To remove the dust from the heat transfer plates, use a solvent.
3. Examine if the heat transfer plates are damaged.
4. If a heat transfer plate has unevenness, do the grinding of the heat transfer plate.
5. To apply the heat transfer compound equally to the heat transfer plate, use a paint roller.
6. Install the cooling plate.

**Result** The cooling system is installed to the frequency converter.

### 10.3.3.5 Setting Parameter of the Frequency Converter

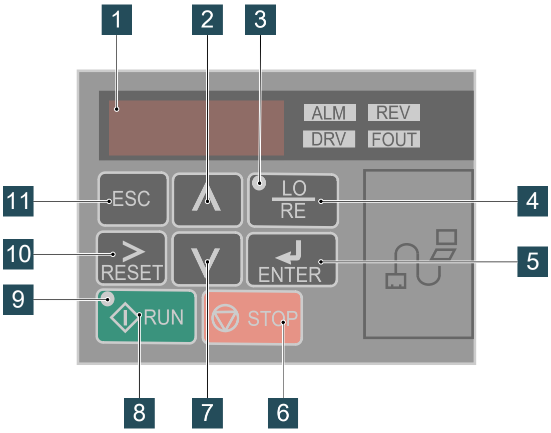

*Figure 402: Operating unit of the frequency converter*

| | | | |
|---|---|---|---|
| 1 | Display | 2 | Up |
| 3 | Local/remote LED | 4 | Local/remote button |
| 5 | Enter | 6 | Stop |
| 7 | Down | 8 | Run |
| 9 | Run LED | 10 | Reset |
| 11 | Escape | | |

### Setting Authorization of the Frequency Converter

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Select the **Service mode** in the data screen 80.1.
2. Select the data screen for the frequency converter test.
3. Start the test and select the frequency converter from the data screen.
4. Push the start button.

   ⇨ Voltage is applied to the selected frequency converter.
5. Tap the key 2 or 7 until the parameter Par shows on the display 1.
6. Tap the key 5.

   ⇨ The parameter A1-01 flashes on the display 1.
7. Tap the key 5 for some time until the display 1 shows the parameter A1-01.
8. Tap the key 10, or 2, or 7 to set the value to 0002.
9. Tap the key 5.

   ⇨ The value End shows in the display for a short time. Then the value 0002 and the parameter A1-01 show for a short time.

**Result** The authorization of the frequency converter is set.

### Initializing the Frequency Converter

**Prerequisites** Make sure that the criteria are obeyed:
- ✓ Authorization is set.
- ✓ Parameter A1-02 flashes on the display.

1. Tap the key 10 or 2 to change the parameter A1-02 to the parameter A1-03.
2. Tap the key 5.
3. Tap the key 10, or 2, or 7 to set the value to 2220.
4. Tap the key 5.
   ⇨ Parameter A1-03 shows on the display.

**Result** The frequency converter is initialized.

### Setting the Baud

**Prerequisites** Make sure that the criteria are obeyed:
- ✓ Authorization is set.
- ✓ Parameter A1-02 flashes on the display.

1. Tap the key 10, or 2, to change the parameter A1-02 to the parameter F6-36.
2. Tap the key 5.
3. Tap the key 10, or 2, or 7 to change the parameter F6-36 to the parameter F6-30.
4. Tap the key 5.

**Result** The baud is set.

### Setting the Node Address

**Prerequisites** Make sure that the criteria are obeyed:
- ✓ Authorization is set.
- ✓ Parameter A1-02 flashes on the display.

1. Tap the key 10 or 2 to change the parameter A1-02 to the parameter F6-35.
2. Tap the key 5.
3. Tap the key 10 to select the last digit.
4. Tap the key 2 or 7 to set the node address. (The node address is shown in the related data screen.)
5. Tap the key 5.

**Result** The node address is set.

### 10.3.4 Display Elements and Operating Elements

This section contains the information about the repair work of the display elements and the operating elements.

#### 10.3.4.1 Replacing the Key Strip

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Remove all blind plugs and connectors of the operating unit.
4. Loosen all bolts 1.

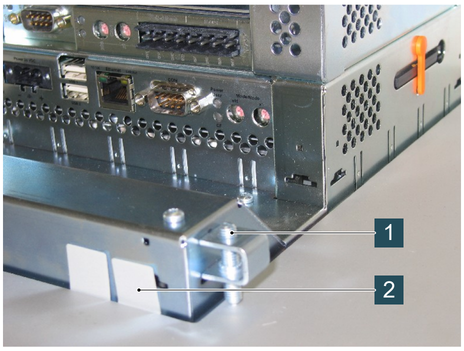

*Figure 403: Key strip*

5. Remove the operating unit from the base plate.
6. Pull out the key strip 2.
7. Put a new key strip.
8. At the end of the key strip 2, put a mark of 23 mm.

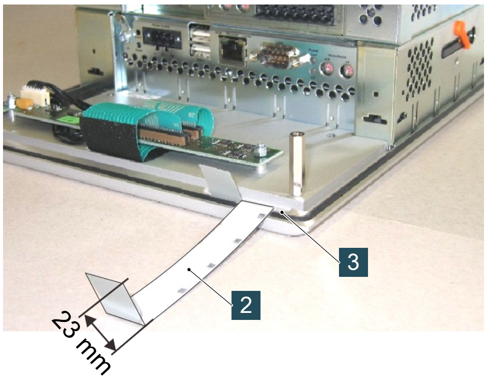

*Figure 404: Installation of the key strip*

9. At the identified mark, fold the key strip at a 90 degrees.
10. Push the key strip into the opening 3.

**Result** The key strip is replaced.

### 10.3.5 Pneumatic System

This section contains the information about the repair work of the pneumatic system.

### 10.3.5.1 Replacing the Silencers

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Replace the silencers 1 to 6.

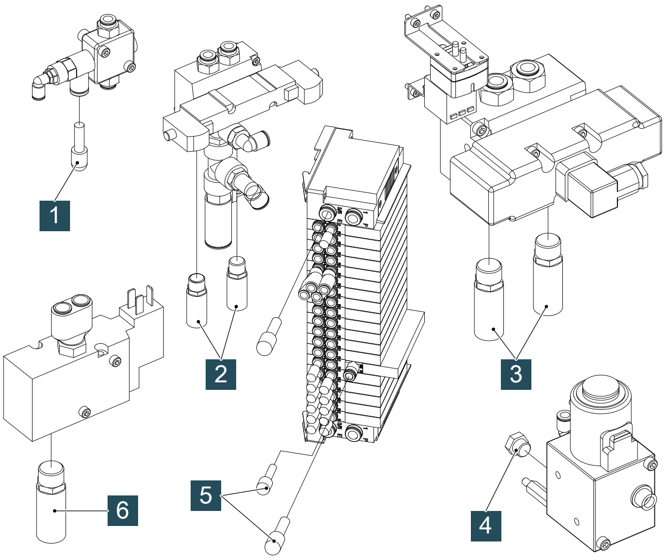

*Figure 405: Silencers*

**Result** The silencers are replaced.

### 10.3.5.2 Removing an Individual Valve

**CAUTION**

**Uncontrolled release of compressed air!**

Eye injury

▶ Always put on the safety glasses when you use the compressed air.

**Prerequisites** Make sure that the criteria are obeyed:

- ✓ The handle of the main compressed-air valve is set to the horizontal position.
- ✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Push the ring 2 in the direction of the arrow 1.

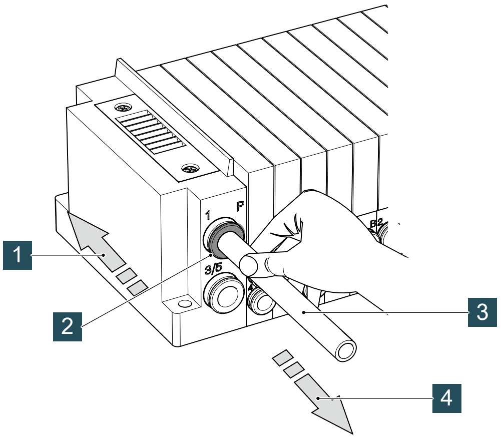

*Figure 406: Removal of the individual valve*

⇨ The connection is released.

4. Pull out the main air pipe 3 in the direction of the arrow 4 at the same time.

⇨ The main air pipe is disconnected.

5. Examine the label at the air pipe.
6. Remove the two air pipes from the valve.
7. Remove the screws 5.

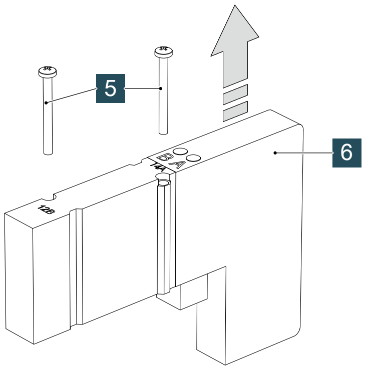

*Figure 407: The procedure of disassembling the individual valve*

8. Pull out the valve 6 in the direction of the arrow.

**Result** The individual valve is removed.

### 10.3.5.3 Installing an Individual Valve

**Prerequisites** Make sure that the criteria are obeyed:

✓ The machine is at a standstill.

1. Set the main switch to the position OFF.
2. Padlock the main switch.
3. Put the valve 2 in the slot 3.

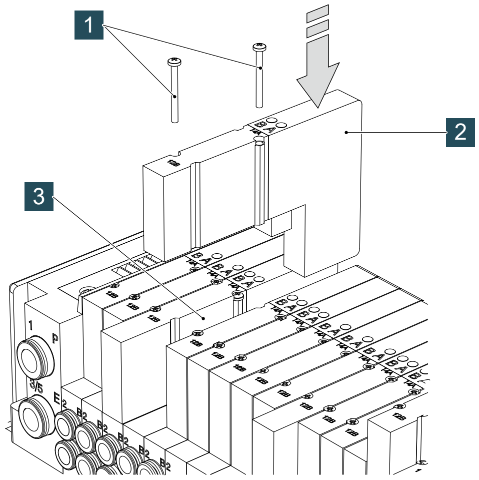

*Figure 408: Installation of the individual valve*

4. Push the valve 2 until it locks into position.
5. Install the screws 1.
6. Put the air pipes to the connection points according to the label on the air pipes.
7. Push the pipe into the joint.
8. Blind plug in the electrical connection parts.
9. Start the manual control of the solenoid valve.
10. Do the test functions for the individual valve.

**Result** The individual valve is installed.

# 11 Decommissioning and Storage

This chapter contains information about:

- The personnel
- The temporary decommissioning of the machine
- The final decommissioning of the machine
- The storage of the machine

## 11.1 Decommissioning Personnel

Only Rieter-approved personnel are permitted to do the decommissioning and storage of the machine.

## 11.2 Measures for Decommissioning and Storage

### Temporary Decommissioning

Temporary decommissioning is decommissioning only for a short time because of a shutdown. The purpose is to set the machine back into operation after the end of the shutdown.

These temporary decommissioning works are to be done:

1. Remove the fiber material from the machine.
2. Remove all operation fluids from the machine. Obey all national regulations for the storage or disposal of all operation fluids.
3. Set the main switch to the position OFF. Padlock the main switch.
4. Disconnect the compressed-air supply.
5. Let the machine temperature go down to the ambient temperature.
6. If available, remove all roller loads.
7. Remove all technology components.
8. Release the tension from the timing belts, the flat belts, or the V-ribbed belts.
9. Clean the machine and all technology components correctly. Prevent corrosion and impurities at the machine and all technology components.

### Final Decommissioning

The purpose of a final decommissioning is to prepare the machine:

- For storage for a longer period
- For transport to a different location
- For disposal

This work for the final decommissioning is to be completed:

1. Remove the fiber material from the machine.

2. If available, remove all roller loads.
3. Remove all technology components.
4. Remove all operation fluids from the machine. Obey all national regulations for the storage or the disposal of all operation fluids.
5. Set the main switch to the position OFF. Padlock the main switch.
6. Disconnect the compressed-air supply.
7. Disconnect the power supply to the machine.
8. Let the machine temperature go down to the ambient temperature.
9. Release the tension from the timing belts, the flat belts, or the V-ribbed belts.
10. If the machine is prepared for storage, clean the machine and all technology components correctly. Prevent corrosion and impurities at the machine and all technology components.
11. Disassemble the machine into units that stay in a safe condition during transport.
12. Use the original transport locks and the original packaging materials. Obey all transport regulations. *Packaging and Transportation ▸ 69*

## Storage

1. Keep the machine in a clean and dry room. Put the machine and the machine parts on a flat surface. Identify the machine with an identification mark.
2. Do not let unauthorized personnel go into the storage room.

# 12 Disposal of the Machine

This chapter contains information about the disposal of the machine after the end of its service life.

The machine owner is responsible for the correct disposal of the machine.

The instructions in the chapters that follow are to be obeyed:

- Safety
- Packaging and Transportation
- Decommissioning and Storage

The national regulations for the disposal of the machine and all operation fluids, batteries, and packaging materials are to be obeyed.

Disposal includes:

- Reusability
- Recycling
- Disposal of waste

The materials are to be divided in relation to the material group. The materials are to be given to the correct collection point:

- Steel
- Copper
- Brass
- Rubber
- Electronic waste
- Cast iron
- Glass
- Plastics
- Liquid materials
- Dangerous waste

The machine manufacturer Rieter is to be told about the disposal of the machine.

E-mail: info@rieter.com

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# 13 Appendix

This chapter contains information about:

- Standard tightening torques
- Tools and gauges

## 13.1 Standard Tightening Torques

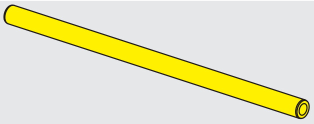
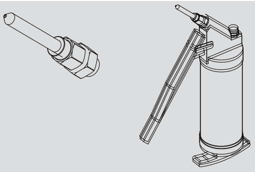
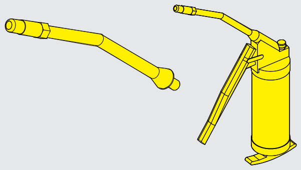
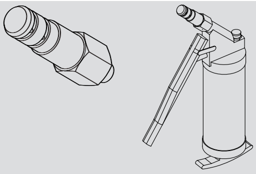
| Screw Dimension | Strength Class | Tightening Torque [N•m] | Clamping Force [kN] |
|---|---|---|---|
| M4<br>Friction coefficient<br>4G = 0.14 | 4.8 (welding stud) | 1.5 | -- |
| | 8.8 | 3.1 | 3.9 |
| | 10.9 | 4.5 | 5.7 |
| | 12.9 | 5.3 | 6.7 |
| M5 | 4.8 (welding stud) | 3.0 | -- |
| | 8.8 | 6.1 | 6.4 |
| | 10.9 | 8.9 | 9.3 |
| | 12.9 | 10.4 | 10.9 |
| M6 | 4.8 (welding stud) | 5.0 | -- |
| | 8.8 | 10.4 | 9.0 |
| | 10.9 | 15.5 | 13.2 |
| | 12.9 | 18.0 | 15.4 |
| M8 | 4.8 (welding stud) | 13.0 | -- |
| | 8.8 | 25.0 | 16.5 |
| | 10.9 | 37.0 | 24.2 |
| | 12.9 | 43.0 | 28.5 |
| M10 | 4.8 (welding stud) | 25.0 | -- |
| | 8.8 | 51.0 | 26.0 |
| | 10.9 | 75.0 | 38.5 |
| | 12.9 | 87.0 | 45.0 |
| M12 | 8.8 | 87.0 | 38.5 |
| | 10.9 | 130.0 | 56.0 |
| | 12.9 | 150.0 | 66.0 |
| M14 | 8.8 | 100.0 | 52.6 |
| | 10.9 | 146.0 | 77.2 |
| | 12.9 | 171.0 | 90.4 |
| M16 | 8.8 | 215.0 | 72.0 |
| | 10.9 | 310.0 | 106.0 |

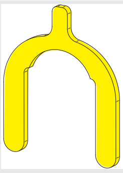
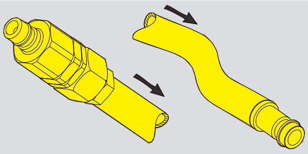
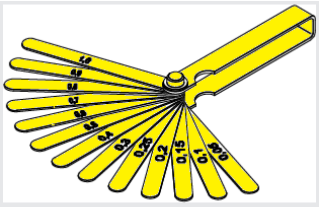
| Screw Dimension | Strength Class | Tightening Torque [N•m] | Clamping Force [kN] |
|---|---|---|---|
|  | 12.9 | 370.0 | 124.0 |
| M20 | 8.8 | 430.0 | 117.0 |
|  | 10.9 | 620.0 | 166.0 |
|  | 12.9 | 720.0 | 194.0 |
| M24 | 8.8 | 740.0 | 168.0 |
|  | 10.9 | 1080.0 | 239.0 |
|  | 12.9 | 1240.0 | 280.0 |

## 13.2 Tools and Gauges

This chapter contains the Rieter-specific tools and gauges for:

- The transport of the machine
- The maintenance of the machine
- The repair of the machine

| Tool | Tool Name | Function Description |
|---|---|---|
|  | Adjusting shaft | The tool is used to align the guide bushes of the lap flanges. |
|  | Grease gun adapter for recessed lubricating nipples | The grease gun adapter for recessed lubricating nipples lets grease to be pushed into the recessed lubricating nipples.<br>1 stroke = 0.5 $cm^3$ |
|  | Grease gun adapter for taper lubricating nipples | The grease gun adapter for taper lubricating nipples lets grease to be pushed into the taper lubricating nipples.<br>1 stoke = 0.5 $cm^3$ |
|  | Grease gun adapter for bearing bushing | The grease gun adapter for bearing bushing lets grease to be pushed into the bearing bushings of the top drafting rollers.<br>1 stroke = 0.5 $cm^3$ |

| Tool | Tool Name | Function Description |
|---|---|---|
|  | Spacer | The spacer is used to hold the drive shaft. |
|  | Oil hose | One oil hose is used to drain oil. One oil hose is used to add oil.<br>Dimension: 2 m for each oil hose |
|  | Feeler gauge | The feeler gauge is used to measure the distance between the machine components. |

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